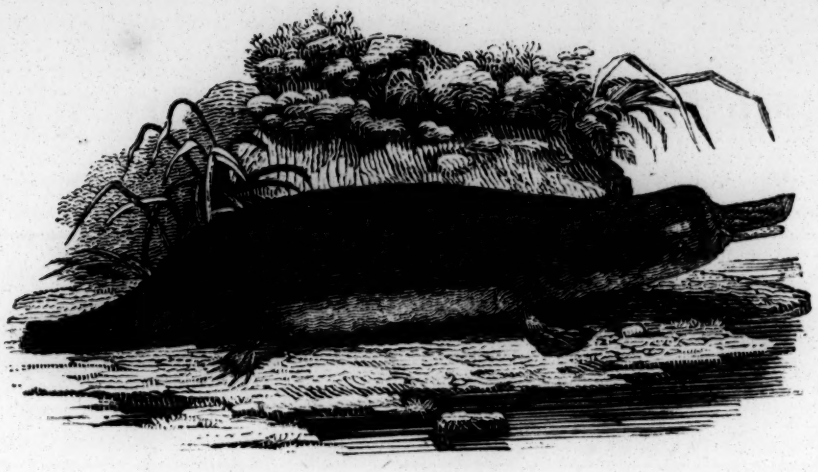
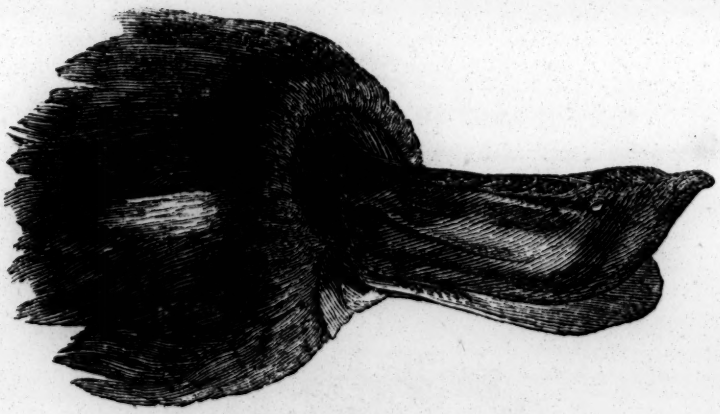






RECREATIONS

IN

AGRICULTURE, NATURAL-HISTORY,

ARTS,

AND

MISCELLANEOUS LITERATURE.

BY

JAMES ANDERSON, LLD.

FRS. and FSA. E.

Honourary member of the Society of Arts, Agriculture, &c. Bath; of the Philosophical Society, Manchester; of the Agricultural Society, Altringham; of the Philosophical Society, Newcastle; of the Society for promoting Natural History, London; of the Academy of Arts, Sciences, and Belles Lettres, Dijon; of the Royal Society of Agriculture, St. Petersburgh; of the Royal Economical Society, Berlin; of the Philosophical Society, Philadelphia; of the Bahama Agricultural Society; correspondent member of the Royal Society of Agriculture, Paris; and author of several performances.

KNOWLEDGE IS POWER. BACON.

VOL. VI.

Being the Second of the Second Series.



LONDON:

PRINTED BY T. BENSLEY,

Bolt Court, Fleet Street;

And sold by JOHN CUMMING, No. 40, Holborn Hill.

1802.



31.

SEPTEMBER 1801.

RECREATIONS, &c.

N° 1. Second Series, Vol. II.

Disquisitions respecting language, and the qualities and uses of the different modes of writing that have been hitherto devised.

FEW objects can prove more interesting to the contemplative mind, than disquisitions respecting language; for on that subject, at every step we advance, order seems to arise out of confusion, and the mind becomes enchanted by the discovery of luminous facts that tend to ennoble the human species, and exalt man to an elevated rank in the universe, infinitely superior to the brutes that perish.

Language is the child of reason, and the parent of every superior attainment. Without the rational faculty, no animal can ever attain the powers of speech, so as to communicate to another with accuracy and precision either the perceptions of its own mind, or the knowledge of events that are at a distance and unseen; and without these faculties the *species* can never advance either in knowledge or in power. Each individual, without that faculty, finds itself placed in the world an isolated being as it were, unknowing of all

that has past before its own time, and unsolicitous of all that shall happen in future; this creature is therefore, in all succeſsive ages, in exactly the same situation as if it were the first of its species that had appeared on the globe: it follows its own natural instincts, therefore, after the same manner at all times, adapts itself to its present situation in the manner that those instincts direct; and, unleſs it be the care of providing for its own safety and subsistence, and the instinctive impulse of continuing its kind, it aims at nothing more. Not so with man. In as far as regards the mere animal existence, its preservation, and the continuation of the species, he is indeed subjected to the same universal law that pervades the whole of animated nature; but, by means of speech, his intellectual faculties are susceptible of immense advances. His knowledge is improved by the wisdom of others; he is enabled to profit by the experience of those who have long ago ceased to exist, and to look forward to the effects of his exertions long after he shall be removed from among those who are to be benefited by his labours. An individual, at the present time, feels himself in a very different situation from what he must have been had he been the first of his kind: the knowledge and the power of the *species*, therefore, is progreſsive, still more than that of the individual, and it may thus in time acquire attainments that must have infinitely exceeded the perceptions of the most perfect individual, had he been placed in an isolated situation, even although he should have accidentally met with others of his species who had been placed in the same circumstances with himself.

But, in whatever situation man had been placed, did he but find others of his kind with whom he could associate so as to continue the species, language would have been among the first of his inventions, and speech would have added zest to his highest enjoyments. He would thus lay the foundation of improvements that would be adopted by his posterity, the effects of which would be felt by future ages long after the memory of the original person had entirely failed: but these improvements would be more or less perfect in proportion to the perfection that his language had attained, the facility with which it could be communicated to others, the certainty with which the meaning could be fixed, and the ease with which it could be transmitted from one place to another at whatever distance of time or space they might be separated.

Under this point of view, we can easily perceive the vast importance of the discovery of the art of writing, which, by fixing the meaning of the person who employs it, admits of his ideas being transmitted with unabated force to the most remote regions, or to the most distant period of time, as long as the writing itself, or a copy of it, can be preserved. The possibility of multiplying copies, therefore, at a small expence, must give an amazing extension of power to the energies of the human mind; because it becomes the means of transmitting the knowledge which one individual has attained, after years of intense application and study, to innumerable multitudes who could otherwise have had no opportunities of knowing it. The art of printing has therefore been, with good reason, deemed one

of the highest improvements that the invention of man hath ever yet devised.

For several ages past, men have seemed to be nearly satisfied with these attainments; and their conduct would seem to indicate, that the art of writing, as it hath been hitherto practised, and that of printing, have been already carried to nearly the ultimate perfection of which they are susceptible; for no serious attempts have been made to improve upon them in radical principles, as if a general conviction prevailed, that nothing of that sort was in effect practicable.

It is, however, one of the peculiar attributes of the reasoning faculty, that it must be continually progressive if its energies be exerted, and never can attain its ultimate degree of perfection in any one instance; so that it is contrary to the principles of reason ever to suppose that the utmost attainable perfection has been reached in any one instance. *Plus ultra* then ought to be the motto never to be lost sight of by every reasoning man. Let us ever avail ourselves with gratitude of the improvements of others; but let us not, on account of the admiration that these may justly excite, ever despair of being able to go yet farther. All just reasoning is grounded on facts, and our knowledge of facts is as yet extremely limited; so that the experience of every day is bringing forward the materials for progressive improvements. Besides, it is impossible for any one to say, that all the uses of which it is susceptible have been made of any well known fact, as the experience of every attentive man must quickly convince him; for how often do we see that, by a new application of well-known principles, effects of

the most salutary or surprising kind are produced, by means, perhaps, of such a simple and obvious nature, that every one who contemplates them wonders how he himself could have been so dull as not to have discovered them. Let us not, therefore, ever despair of being able to advance farther than yet has been done: but more particularly let us avoid condemning, without serious examination, any proposition that seems to announce more than we think, upon a general view of the case, can posſibly be attained; for no one, even if he has previously considered the subject with attention, can be certain, that some important particulars may not have escaped his notice: but, among the multitudes of mankind, how few are to be found that have ever considered any one subject with attention? It is evident that such persons ought to be slow, very slow indeed, to condemn what to them may appear to be improbable.

But if there be reason for those who contemplate a new proposition to be slow in rejecting it, there is still greater reason for their being cautious how they approve of it. Among contemplative men, there are ten at least led away by imperfect views of things, for one who deliberately forms a judgment from a cautious discrimination of all the circumstances that affect it: their decisions, therefore, ought ever to be viewed with distrust by such as find themselves incapable of judging with precision; and those who are capable of appreciating the matter fairly, ought only to decide after they have examined the case with the most mature and deliberate consideration. Such is the conduct that I wish to be adopted respecting an improved mode of writing that I am now about to lay before the public,

which, if it had not appeared to me to be not only practicable, but easy, I should never have ventured to propose, although the benefits that would result to society from the adoption of that mode of writing when they come to be fairly developed, will appear to be so great, that the first sensation which must be felt by every person who reads the account will be, that were the matter so obvious, and the means of carrying it into execution so easy as it will be represented, it is impoſsible to conceive that it should have escaped the sagacity of our forefathers, and that therefore it is unneceſsary to bestow any farther attention upon it.

To obviate this mode of reasoning, I shall only beg leave to bring to the recollection of my readers one obvious fact which all of them must know: it is, that the Arabic mode of notation was introduced into Europe only a few centuries ago: that before that period neither the ingenuity of the Greeks, whom we are all accustomed to view as the most exalted race of men, nor the sagacity of the Romans, who were our preceptors in most improvements, had enabled them to discover: yet this invention is so extremely simple, that a child of ten years old can easily comprehend it; and it so much facilitates every arithmetical operation, as to render perspicuous to the most simple of mankind, accounts which must have puzzled the most acute philosopher of antiquity to have solved. This system of notation (now in common use) is indeed, so far as I can judge, the most beautiful of all the inventions of man, if the amazing effects that may be produced by it are compared with the wondrous simplicity of the means, and the facility of applying them in practice: yet the world was near four thousand years

old, and many nations of great celebrity in the historic page for civilization, literature, and arts, had finished their career, before any one thought of applying it to the uses which it is now found completely to answer.

Probably, most of my readers will be inclined to think that these precautions on my part are no more than neceſsary when they shall be told, that I mean to show that it is by no means impoſsible to devise a mode of writing, by means of which any two or more persons who speak different languages, and neither of whom knows more than his mother tongue, may correspond with each other, and that a letter written in that manner by any of the parties shall be equally understood by the party to whom it is addreſsed as if it had been written by one who made use of no other language than his own; and that he, in his turn, may send an answer to his correspondent, which shall be equally intelligible to him as if it had been written by one who used his own native dialect. On the first enouncing of this proposition, it may to some appear wonderful, and to others impoſsible; yet a due attention to the nature of language will be sufficient to prove, that it is, not only not impoſsible, but admits of being performed with a facility which has no parallel, unleſs it be the Arabic mode of notation of numbers, and would be productive of a degree of accuracy in the communication of ideas that is unattainable by man in any other mode that hath hitherto been attempted.

Language, it has been already said, is the offspring of reason; and wherever a body of rational beings have been congregated together, language has been invented, and speech has been employed as the medium for con-

veying ideas from one person to another. But, although language be thus natural to man, we can find no common source of its origin, but in those ideas that are congenial to the human mind. Its basis is, in this respect, invariably the same. In every part of the world, human beings are actuated alike by hopes and by fears; their hearts are all exhilarated by joy, and depreſsed by grief: in every country on the globe, the light of the sun brings under view an immense variety of objects that are pleasing to the senses and attract the notice of man, most of them ministering to his wants, while some are offensive or hurtful. In every district where man exists, he must alike eat and sleep, be subject at times to the interruption of his usual state of health, and finally to death, when a total ceſsation of all the animal functions takes place. The great objects of the contemplation of men, then, are invariably the same, though in leſser particulars some variation may take place. Hence it must happen, that language, which is the result of the impreſsions of the mind, among whatever society of men it shall have been formed, must be radically the same in all cases; though the vehicle that shall be employed for reciprocally communicating those impreſsions, in other words, the forms of speech, may be infinitely diversified.

In this way we are enabled to trace the origin of those principles of universal grammar which are found to be the same in all languages, from that of the rudest savages to the most refined people on the globe; the copiousneſs, delicacy, and accuracy of language, being in all cases proportioned to the mental acquirements that the people who use it have attained; so that a person who has been accustomed to use one lan-

guage never finds a difficulty in communicating his ideas to those who use another, as soon as he has learnt the words, or sounds, or signs, that are employed by that people to denote the various objects of perception. He has only to advert to the native impreſsions on his mind, and then present his ideas in the new form in which he has just learnt to dreſs them. He finds that language, under these circumstances, may be aptly compared to a traveller who, having gone from Europe into Asia, is compelled to lay aside his christian garments, and aſsume the robes that are worn by the followers of Mahomet. His external form is now indeed changed; and the one dreſs may be more pleasing to him, or more commodious in some respects, while in others it is leſs so, than that which he has been accustomed to wear; but still the man is in both cases radically the same. Indeed, every person who has learnt to use more languages than one knows that he has little else to do than to acquire a facility of translating one word into another of similar import; a few accidental inflections only of particular claſses of words forming small degrees of uneſsential differences.

Man, like every other animal, naturally denotes acute sensations by means of his voice; and as the organs connected with the voice are, in him, extremely flexible, he has been induced, from that circumstance, invariably to employ these organs to modify sounds for conveying to others his perceptions of every kind. Hence his language is a collection of modulated, or, as we call it, articulate sounds, to which we have given the name of speech: and as every distinct collection of persons, who formed a language for themselves, made use of such sounds and such modifications of these as

accident recommended to them, the language of each original tribe was of course different from the others; so that the speech of one was often totally unintelligible by the others; to which cause, and the blending of different tongues together when different tribes came to intermix, we are, setting aside divine interposition, to ascribe the diversity of languages and dialects that prevail among men.

But although men, from the above considerations, have invariably adopted the mode of conveying their meaning to each other by means of *sound*, yet it is sufficiently obvious, that their ideas might have been conveyed by the ministration of other organs than those of the voice and ear, if they had been so inclined; for other senses are capable of being made use of as organs for marking distinctions as well as the ear. It has been indeed found by experience that speech, or the communication of ideas by means of sounds, is not alone capable of answering all the purposes of civilized society. It is fleeting and evanescent, so as to be liable to misrepresentation and doubt: ideas cannot, by its means, be communicated to those at a distance in regard to space; nor can the recollection of it be preserved by that means alone with accuracy and precision to future ages. Men have, therefore, devised another mode of communicating ideas by means of the organs of *sight*, which we call writing. This is, in fact, a distinct species of language that speaks, if you please, through the eye, by means of which men may converse without the aid of sounds of any kind. Sound, then, is by no means an essential requisite of language: language might exist without it; and it will of course follow, that who-

ever should be instructed in this kind of mute language could converse, by means of it, with another who used it likewise, though each of these were in the practice of using at other times a vocal language whose sounds and articulations were altogether so dissimilar as to be totally unintelligible to each other.

This proposition will be rendered plain by a very simple illustration. The marks 1, 2, 3, 4, &c. are recognised by every one who has been taught arithmetic whenever they are seen, and perfectly understood, though they do not necessarily designate any determinate sound. Accordingly, were any person who understands these marks to be desired to express in words what ideas these conveyed to his mind, he would readily, if an Englishman, say, they denoted the numbers which he had been accustomed to express by the combination of sounds marked by the letters ONE, TWO, THREE, FOUR, and so on. If he were a Frenchman, he would as readily answer, UNE, DEUX, TROIS, QUATRE, and so on. A German would in like manner designate them by the words that were employed to denote the same numbers in his own language; and so would a Dane, a Russian, or one of any other nation: whatever language he used, all would alike understand these signs: they would convey precisely the same idea to the mind of each; though, had the person who put down these marks to be cognisable by the eye, made use of the language of sounds, no one among them could have comprehended his meaning.

Here then is a clear and precise illustration of the principle that I have propounded, and at the same time an example of the nature of that language which I

wish to recommend; but in a case that has so seldom been adverted to, some farther illustrations may be necessary, in order to soften somewhat of that kind of reluctance which men feel to recognise a truth that is presented to them for the first time, when it seems to controvert notions that they have been accustomed to confide in from their infancy.

I am acquainted with only three modes that have been hitherto devised for forming a written language: these have been called the *hieroglyphic*, the *alphabetic*, and the *symbolic* modes of writing. I omit the Mexican *quipos*, as being in a great measure unknown to me.

In the *hieroglyphic* mode, an attempt was made to convey an idea of corporeal objects by delineating the figures of them; but this mode of writing is so defective, and liable to such manifold and palpable objections, that it has been adopted on few occasions, and applied to particular purposes only.

The *alphabetic* mode of writing is so much more perfect than the former, that it has come into general use among all the nations in Europe, as well as throughout the greatest part of Asia and Africa, and is in general esteemed by the people of Europe the most perfect mode of writing that hath hitherto been devised; or, indeed, the only one by means of which ideas can be communicated with accuracy and precision.

The *alphabetic* mode of writing is an attempt, not to form a language, but merely to convey an idea of sounds from one person to another by means of the eye; and, in order to do this, a very circuitous mode of procedure has been devised, which subjects those

who use it to great labour and many other inconveniencies. Nor is it poſsible, under that mode of notation, to render the writing of those who use any one language in the smallest degree intelligible to those who are unacquainted with that language. It certainly indicates a great effort of the human understanding to have devised it; but, like those large and complicated machines that have sometimes been constructed by ingenious men, though it does effect many of the purposes intended by it, this is done in an awkward and incommodious manner.

For the purpose of constructing this mode of notation, it was neceſsary, in the first place, to devise certain marks or characters which denote all the simple sounds that the human voice is capable of uttering: these simple sounds we have called *vowels*, and they are in English six, viz. A, E, I, O, U, Y. By the help of these letters, we are enabled to make an imperfect approximation to the delineation of sounds on paper. Another set of letters have been contrived for the purpose of marking the various ways in which these sounds can be modified by the organs of speech, such as B, C, D, &c. which we call *consonants*. These vowels and consonants we are taught to combine with much labour and art into syllables and words; so that, by means of a complication of rules, and exceptions to rules, we are enabled in the course of time to expreſs, by the voice, in an imperfect, though intelligible manner, those sounds which are indicated by the letters.

The *symbolic* mode of writing, on the contrary, constitutes of itself a language that has no neceſsary connexion with sound whatever, and is constructed pre-

cisely after the same manner that oral language, in every instance, must have been originally formed: that is to say, a distinct mark must be made to denote every distinct idea, exactly as a distinct sound, or modification of sounds, in oral language, expreſses a distinct idea. In both cases, the arrangement is entirely arbitrary; and the signs made use of come to have a definite meaning only by being constantly employed to denote the same thing.

From this view of the subject, the reader will perceive that there is one great and radical distinction between the alphabetic and the symbolic mode of writing; viz. that alphabetic writing must be confined solely to those persons who make use of one oral language only, and that it never can be made to extend to those who use another oral language than that upon which it was formed; whereas no such neceſsity exists reſpecting symbolic notation; the characters in this case having a meaning totally unconnected with sounds of any sort; and, therefore, those who understand these characters are at liberty to expreſs the idea that these convey by any sounds that they have been accustomed to employ in oral language to denote the same object. An example will make this matter plain; nor will it be neceſsary for our purpose to have recourse to any other than that which has been already adduced.

By the symbolic mode of writing, I mark down the following figures, 1—5—15—55—99—111—121—1525—1999. Each of these characters indicates a certain number only, and has no reference to sounds of any sort: they convey a clear and precise idea to the mind of every person who has learned that mode of notation, without requiring to be put into words of any

sort, unleſs the person reading it shall choose to do so; they are therefore equally well understood by an Englishman and a Frenchman: but let each of these persons be required to write the same things according to the alphabetic mode now in use, and the marks would stand thus:

A Comparative view of the Symbolic and Alphabetic Modes of Writing.

SYMBOLIC.	ALPHABETIC.	
	English.	French.
1	One	Une
5	Five	Cinque
15	Fifteen	Quinze
55	Fifty-five	Cinquante & cinq
99	Ninety-nine	Quatre vingt dix neuf
111	One hundred and eleven	Cent & onze
1121	One thousand one hundred and twenty-one.	Mille cent & vingt une
1525	One thousand five hundred and twenty-five	Mille cinq cent vingt cinq
1999	One thousand nine hundred and ninety-nine.	Mille neuf cent quatre vingt dix neuf

In glancing over these columns from top to bottom, the following particulars are especially observable, viz. *first*, the brevity of the symbolic system compared with the others, a single cypher in the one supplying the place of a whole word or more, consisting of many syllables in the others; and, *secondly*, the confined nature of the alphabetic compared with the symbolic mode; for in the first mode, the sounds expreſsive of the same thing being entirely different in each language, the writing must of course be different also; so that it can be intelligible only to those who use the same language; whereas, according to the symbolic mode, the figures are the same in all cases, and are therefore alike intelligible to all who use that mode of writing; so that were it not two, but two hundred different nations, who had each a different word for the same thing, the writing would be alike intelligible to the whole; and each of them, if he were to put the ideas thus communicated to him into words, would do it in the words that he was accustomed to employ, without knowing or regarding how the same thing would be named in the oral language, employed by the writer or any other.

The benefits that would result to society from these two peculiarities, were this mode of writing practised, are great and obvious; for, the labour and expence of writing must be thus diminished in proportion to the diminution of the size of the writing; so that it might be said in many cases to lengthen the life of man far beyond the term at present allotted to it, by enabling him to apply his mind to other pursuits than he now dare think of. It is like knocking the chains

from the galley slave, and granting him freedom for more than half his time, instead of his being compelled to drag continually at the oar; and, in the next place, it would so much facilitate intercourse, both mercantile and literary, between different nations, as would be productive of benefits which it would far exceed the limits of this eſsay to attempt to enumerate. These consequences are so obvious, that one who contemplates them cannot help wondering that no person in these kingdoms should ever have bestowed a thought, as it should seem, upon the subject, with a view to discover if it were practicable to introduce such a mode of writing into general use; and, if it seemed not so, to ascertain at least what were the bars that stood in the way to it.

My own mind was so forcibly impreſsed by these considerations some years ago, that I could not deny myself the satisfaction of bestowing a few hours attention on the subject; nor was it long before I saw cause to believe that the reason why the thing had never been done, was merely because it had never been seriously attempted. The first inquiry naturally was, whether this mode of writing had ever been carried into practice by any of the human race. In taking a cursory survey of all that I had read respecting different nations, it was easy to trace, from the imperfect accounts that we have of the Chinese language, notwithstanding the glaring absurdities of those accounts in many particulars, that vestiges of this practice were there plainly perceptible. Upon a nearer investigation, the thing became more and more evident; till at last it appeared to me to be established, by the most un-

deniable documents, that the writings of China are of the true symbolic cast, and answer in every respect the eſsential characteristics above delineated of that mode of writing: though the truth is so much obscured by the ignorance of those who have written on that subject, that this conviction can only be attained by a species of induction that is not at the first view extremely obvious.

It is, for example, a fact established beyond the poſsibility of denial, that the languages of Japan, Siam, and Cochin-China, are eſsentially different from each other, and from the Chinese, and that the inhabitants of neither of these countries understand the language *spoken* by the others; yet it is equally certain, that books written by the Chinese are alike understood by the Japanese, Siamese, and Cochin-Chinese, as by the persons who wrote them. This is a proof next to positive, that the symbolic mode of writing is there practised, which alone poſseſses the singular characteristic of being in no way dependant on any *spoken* language whatever.

Again: among the various accounts of China it appears, that as a *verbal* language the Chinese is easily acquired by any one of moderate abilities who resides in that country for a short time, as the practice and preaching of the miſsionaries, who have so often endangered the quiet of that kingdom, plainly show; yet it is very evident from their accounts of the *written* language that they did not understand it; and that it is so different from the mode practised by us, as to have baffled their attempts in general to comprehend the mechanism of it; so that almost every one of these

accounts evidently confound the *written* and the *oral* language together, and thus produce such a chaos of absurdities, that it is a disgrace to the human understanding to think that grave men should not have been ashamed to repeat them. Among these absurdities, however, it is not difficult to perceive, that they obviously derive their origin from the practice of symbolic writing imperfectly understood. This observation may be applied even to the last account that has been published of China by sir George Staunton, who has himself been so little acquainted with this branch of the subject as not to discriminate between the symbolic mode of writing which they seem to employ, and the hieroglyphic, which never was, and never could be, employed for the purposes of common life.

It would be idle to enumerate the absurdities that have been published respecting the Chinese language, which is invariably confounded with their mode of writing. It is only necefsary for me to state, that were it not extremely different from all that is said respecting it, it would be altogether incapable of being employed for the composition of works which undeniably were executed in China. Were it true, as has been often represented to be the case, that a man must have become old in study before he could have attained the knowledge of half the words of the Chinese language, it could not also be true, that men converse together in it with ease and precision; and that there are many thousands of persons in the kingdom who every day transmit to court in writing accounts of every important transaction in the kingdom with accuracy

and dispatch; and that these are read and understood with the utmost facility by those to whom they are sent. Were it true, as is often aſserted, that the language is so complicated, that no one can ever acquire a competent knowledge of it: that, like the hieroglyphic characters of Egypt, every sentence is involved in obscurity, and must be explained by conjecture, it could not also be true that there are, or were, in the French king's library at Paris many thousand volumes of Chinese writings that had been collected there, written with such perspicuity and precision as to be easily read and perfectly understood, not only by the natives themselves, but by Europeans who had read and examined these writings. Were it true, that, after having acquired the knowledge of *fifty thousand* words, a man might be said to be only, as it were, beginning to attain some knowledge of the language, as has been often aſserted, it must also be true that the Chinese nation have a store of ideas that infinitely transcend those of Europeans universally; seeing it has been found, that, with leſs than one fourth part of these words, every idea that has entered into the mind of the most enlightened persons in Europe to conceive can be clearly expreſsed. Were it true, that the life of the oldest inhabitant of China is not sufficient to make him clearly comprehend the writings of that nation, it could not poſsibly happen, that a person in Europe, by consulting these writings only, should, in the space of a very few years, make himself so perfectly master of the language in which these were written, as to comprehend and appreciate their writings on the most abstruse subjects, such as ma-

thematics, physics, metaphysics, chronology, and history, which was the case with Mr. Freret, and still more eminently so with Mr. De Guignes, both of the Royal Academy of Inscriptions and Belles Lettres, who acquired that knowledge in a very short time, so as to be able to give a critical account of many of the Chinese writings on these subjects that were contained in the royal library of France. Yet neither of these gentlemen have ever given a hint, in any of their writings that I have seen, either of the difficulty of attaining that language, or the imperfections which they found in it; but much the reverse.

From all these considerations combined, I think there is just reason to conclude, that the *written* language of China is entirely of the symbolic kind, which gives to them a facility in writing that perhaps is unknown in any other country on the globe, and confers also a permanency on these writings that is unknown elsewhere; for where the writing is intended to perpetuate sound only, as in the alphabetic mode, it must be subjected to those perpetual changes which it is impossible to prevent in oral language; but where the writing tends to perpetuate *ideas* alone, the dress in which these were exhibited to public view may be changed a thousand times without affecting it in the smallest degree. Accordingly we find, by the concurrence of all accounts, that those writings of China which are some thousands of years old, can be read with the same facility as those of yesterday.

Having thus proved beyond the power of denial, by our own practice even, respecting the Arabic notation of numbers (not to mention the notation of

music and algebra, both which belong to the same clafs), that the practice of symbolic writing, which at one period was totally unknown in Europe, has been introduced among us in one particular department of science at least, and has given rise in that to improvements that would have been otherwise unattainable by man, and procured facilities in bufinefs that would have been pronounced utterly impofsible had they been *pro*spectively viewed; ought not this to prove a powerful inducement to make us diligently inquire whether it be not pofsible to introduce the same mode of writing our language in general? Having also shown, that there is good reason to believe that this very thing has been carried into practice universally in China for many ages past, ought not this to furnish an additional stimulus for exertion in regard to this particular department? And ought not these considerations to plead my apology with my countrymen for endeavouring to direct the public attention to this very important object? In hopes that this will be the case, I shall proceed to show, in some of the future Numbers of this work, that the devising a plan for a system of symbolic writing is by no means a task so difficult as at first sight it appears to be; and that, were it adopted, it would give a copiousnefs, a precision, an elegance and perspicuity to the language of the nations who adopted it, that have been hitherto unattainable by any one; and that the knowledge of this mode of writing might be acquired with a facility that would put it within the reach of every person to attain it in a very short time, which would diminish the fatigues of bufinefs,

and facilitate the acquisition of knowledge, to a degree that has never yet come within the contemplation of those who would be benefited by it; any more than the discovery of Logarithms could be conceived by those who were totally unacquainted with the powers of Arabic numerals.

A report of travels made by order of the French government into the Ottoman Empire, Egypt, &c.

[*Continued from Vol. V. or I. of Second Series, page 452, and concluded.*]

On our arrival at Bagdad the Bashaw was dangerously ill. Two Persian physicians who attended him had pronounced him a dead man; his astrologer had also read in the stars a confirmation of it; already had the Kiaya Bashaw and some of the great men begun to intrigue, and the Janiſsaries had resorted to their arms, in order to sell their services to the highest bidder. The Arabs of the desert were only waiting for this event to pillage the caravans, and to rob travellers. The town was threatened with a general insurrection; commerce was suspended, and we were prevented from continuing our route. The Bashaw sent to intreat that we would give him our advice and attention during the time we were waiting to pursue our journey; we could not refuse his request, and in a few days we had the satisfaction of restoring him to perfect health.

From that moment every thing was restored to order; the Kiaya alone paid with his head for the steps

he had taken to succeed to the place of his benefactor. The Bashaw testified his gratitude to us, and presented us with two handsome Arabian horses; he gave us also letters of recommendation to the Khan of Kermancha, and to the ministers of the king of Persia.

We did not lose a moment in procuring Persian dreſses for ourselves, which were absolutely neceſsary, and we set out the 27th Floreal of the 4th year, with the regret of leaving behind us a box containing different very rich jewels, intended as presents for the court of Persia, which the envoy extraordinary from the republic at Constantinople was to have sent us.

The common heat of Bagdad in the summer, during some hours of the day, is 35 or 36 degrees; the thermometer was on the 27th Floreal, the day of our departure, at 30 degrees [this must mean Reaumur's thermometer].

We were witneſs to a phenomenon which explains the origin and cause of that fatal wind which, though rare and momentary, strikes men and animals with death, who do not take proper precautions to avoid its effects.

On our arrival at Kermanchan, the first town in Persia, we presented ourselves to the Khan; we informed him of the object of our journey, and delivered to him the letters from the Bashaw. The Khan asked many questions relative to the different states of Europe, with which he was very little acquainted, and to our manners and customs. He was more curious on those countries dependant on the Ottoman empire, which we had travelled through, and particularly about Bagdad, because near that town the ashes of Ali repose.

He gave orders to one of his officers to accompany us to the court, and had those paſsports which were neceſsary to be delivered to us.

We arrived at Teheran the 13th Prarial, when we learnt that the king and his ministers had left that place the beginning of spring on an expedition, which was suspected to have for its object the complete conquest of Choraſsan.

I was delighted with the idea of making such a journey, and considered it as a most fortunate circumstance, that the king should lead the head of his army in the most interesting province of Persia, into which no European traveller has ever penetrated, and that which furnishes the greater part of those drugs which come to us from the East, and the most remarkable plants. But citizen Bruguiere had been ill for a considerable time, and was threatened with a dysentery; the dragoman himself was unwell; and they did not fail to offer good reasons to diſsuade me from it. It is not known, they said, for a certainty, where the king is; the arrival at an army in this country is always dangerous, for one is stripped and robbed before one is known and protected. We shall take a month to arrive at Choraſsan, and the king is to return in one or two months. These reasons, however, did not counterbalance the advantages which must have resulted to natural-history and geography from such a journey; but I reflected that the health of my colleague was becoming weaker every day, and that he was not in a condition to support the fatigues of such a journey in the hottest season of the year. It would be neceſsary to croſs the Mazandaran, a country hot, marshy,

and unwholesome. The dragoman besides refused to follow us. It was therefore settled that we should wait the king's return in the environs of Tehera, in order to profit of the proper season for making researches in natural-history, the collecting of seeds, and that citizen Brugiere might more easily recover his health.

It was necefsary to take measures, and make some pecuniary sacrifices, to obtain permifsion to leave the town, and establish ourselves at a village at the foot of Mount Albanus. Teheran at this moment contained the hostages which Mahomet had ordered thither from the principal towns in the empire, to answer for his safety; so that one freely entered the town, but could not leave it without an expref's permifsion from the governor. This gentleman did not fail to profit from so good an opportunity of making us liberal of our money. As we foresaw that the presents which had been left behind might be delayed, or perhaps not come at all, we thought it prudent not to mention them. We might, in truth, have offered to the governor a watch or some fire-arms, but then we should have contracted engagements of making other presents to his principal officers, and on the arrival of the king, not having any thing sufficiently handsome to offer him or his ministers, and our presents being detained at Bagdad under pretence of the insecurity of the roads, we should be looked upon as impostors, and lose that confidence which our conduct ought necefsarily to inspire.

The king, after having seized Mesched, and all Chorafsan, having destroyed Charok Cha, the last branch of Thamas Kouli Khan, and carried off his

treasures, returned to Teheran. He made his entry into the capital the 4th complementary day of the year four. Two days afterwards we had an audience of the first minister, with which we had every reason to be satisfied. We cultivated the friendship of the first secretary, an active and enterprising man, and as well informed as one can be in Persia. We informed him of the new government established in France; we made him acquainted at the same time with its resources, its population, its triumphs, and its power; we learned from him very interesting details on the manners, religion, and government of the Persians; as well as a detailed history of the troubles which have desolated these unhappy countries since the dethronement of Cha Hufsein, and more particularly since the death of Nadir Cha.

On the 12th Vendemiare we obtained from the minister an audience of leave, and some days after his secretary delivered to us a letter addreſsed to the republic of France, of which I instantly sent off a copy, and presented the original to the directory myself.

We hastened to complete our observations, and to return to Bagdad, for we already saw the storm arise which has just plunged that miserable country into all the horrors of a civil war. We quitted Teheran the 23d Vendemiare in the 5th year, and took the road to Ispahan. We had made an ample harvest in subjects of natural-history, and in medals; we had collected tolerably exact ideas of the population, revenues, and strength of Persia, concerning its last revolutions, and its commerce. Our journey, however, would have been incomplete if we had not seen the ancient capital

of the empire, and the seat of the Sophis. We remained a month at Ispahan, and arrived at Bagdat the 20th Primaire.

Several European travellers have visited Persia, and have given accounts, more or lefs exact, of this empire. They have informed us of the industry and commerce of the Persians; they have said a great deal of the religion of the followers of Mahomet; they have described the palaces and gardens of Cha Abbas, and his succefsors, as well as the public edifices of Ispahan. Notwithstanding all this, the history of the troubles in Persia since the death of Nadir Cha, the change in the manners, industry, and agriculture, which upwards of sixty years of internal wars must have caused; the formation of a new empire, more powerful than Persia, which extends from Candahar to Cachemire, from Caboul to the Mogul, and which comprehends the fertile banks of the Indus, all this cannot fail of giving a new interest to a new narration. With regard to the productions of nature, it will be seen by the various objects which I shall not delay to publish, how little they are known, and how very interesting and curious the greater part of them are.

Persia is an elevated country, covered with snow in the winter from the Caspian Sea as far as Ispahan; dry, and very hot in summer. There is a mixture of very high mountains and extensive plains, the greater part uncultivated. What ought to surprise every traveller is, that throughout almost this whole empire no earthly production is obtained without irrigation; corn and the vine only grow by means of water; there is not a tree nor shrub but what has been planted by

man, nursed up, and watered by him. Water is neceſsary every where, and yet this country naturally fails in water. The industry of its inhabitants was called forth to supply this defect by subterranean canals which conduct water from all parts, and which end at a common centre, or general reservoir; then by managing the levels they gain a supply, near which they form habitations of greater or leſs magnitude, according as the water is more or leſs abundant, to allow them to cultivate a proportionate quantity of land.

Although I was wounded six days' journey from Bagdat, by a troop of Curdes, in aſsisting my colleague, who was just falling into their hands, I was not leſs in a situation to continue our journey after a short time; but citizen Brugiere, who had been dangerously ill ever since we had quitted Persia, and whose health was very feeble, could not do so for some time. Near six months paſsed away before I could prevail on him to set out on our return home. At the approach of the fine season I several times threatened him to leave him, but I could never prevail on myself so to do, for my conscience would never have ceased reproaching me if, after my departure, my colleague had terminated his days, far from his friend, far from his fellow traveller.

During the time I paſsed at Bagdat, waiting for the re-establishment of the health of citizen Brugiere, I employed myself in collecting different materials for the history of our travels. I have seen the ruins of Seleucia, of Ctesiphon, the place which was formerly occupied by the famous Babylon, the towers said to

be built by Nimrod, which neither time nor man have been able totally to destroy, and which still excite the admiration of travellers.

I have observed the singular nation of the Arabs in Egypt, and in Syria; of whom travellers have differently spoken. I have studied their manners, their usages, and their form of government; there only remained for me to live among them, to travel with them, to frequent their tents, and to receive from their hands a simple, wholesome, and frugal food.

Circumstances forced me to act as a physician at Bagdat; I took that opportunity of seeing the interior of the houses of Muſsulmans, and to become acquainted with the Harems, and the women who are inclosed in them. No traveller has in this respect ever been able to collect so many singular anecdotes.

We set out from Bagdat the 12th Floreal, with a caravan bound to Aleppo. We remained for sixty-five days on the banks of the Euphrates, and in the desart, occupied in the preparing of plants, collecting insects, skinning birds and quadrupeds; in observing the Arabs, the climate, the soil, and the productions of these countries. We staid but a short time at Aleppo; and it was there we found a letter from citizen Aubret-Dubayet, wherein, after the praises he thought proper to give to our conduct, he desired us to return to France by the shortest road. This desire of the ambaſsador for our return to France was exactly conformable to our own wishes, but it was indispensable for us to paſs through Constantinople. Was it poſsible for us to leave behind a scattered collection, the fruit of five years labour and observation, exposed

to the dangers of the sea, and of being pillaged? Is it not a fact that subjects of natural-history, almost always of a perishable kind, ought to be carefully looked after at the quarantines by hands accustomed to such things? How easy would it be to purloin numbers of manuscripts. We had boxes in the house of a merchant at Constantinople, and in one of the apartments of the palace of the ambaſsador. There were great numbers at Scio, and some were at Latachia; we therefore considered it as a duty to collect all together, and to bring every thing with us to Paris, in order that it may be seen on our arrival if we had fulfilled the views of the government, and if we had not disappointed the expectations of the learned.

We wrote to the ambaſsador to inform him of our reasons which had induced us to take the road to Constantinople. At the same time we sent letters to the consuls at Tripoli and Cyprus, begging them to inform us of the first veſsel which should sail for the Archipelago. After this we went to Latachia, where we found only a bad Venetian veſsel, in which the Consul advised us not to embark, for lately the Algerines had insulted the flag of this expiring republic. We then resolved to set out for Cyprus, and to croſs that island, though at the most dangerous season of the year, to gain the coast of Caramania, and to get to Constantinople by croſsing Asia Minor. This journey has been one of the most interesting we have made, as well in regard to natural history, as from the information we collected on the manners of the Turks in a country so little known and frequented, although so interesting.

We arrived at Constantinople the beginning of Brumaire. We should have embarked soon after on board the Serieuse, if our packages from Scio, and those we had left at Cyprus, had been arrived. The ambaſsador was busily employed respecting our embarkation on board the Brune for Athens and Corfu, when he was surprised by death. Ever since that time all our efforts to find a sure and direct embarkation for France have been vain; we thought we should be clear of all danger, and exempt from reproach, by croſsing the Isthmus of Corinth, and gaining our islands in the Levant. It was certainly of importance to us not to fall into the hands of the English, who were spread over the Mediterranean; and it would have been very painful for us to have seen our enemies profit by our labours, and reap the fruits of our attentions and fatigues.

We wrote to citizen Carra St. Cyr, charged with the affairs of the republic at the Ottoman Porte, to inform him of our attentions, to obtain his approbation, to request from him pecuniary aſsistance, and to draw out with him an account of the sums we had received since our arrival in the Levant. We received from him the answer we expected, and such as the circumstances in which we found ourselves demanded.

It may not perhaps be improper to say, that we had reminded the Porte for some time of the services we had rendered it in regard to the pozzolanes; a service which they may have thought to have recompensed by the flattering letter which the Reis-Effendi charged us to deliver to the minister for foreign affairs, accompanied with a present of two thousand piastres. We

should certainly have refused from any other government so mean a sum, so little proportioned to our labours, our expences, to the importance of the discovery, and above all, so much under the promises which had been made us; but a government so little susceptible of liberal and generous actions, would not have felt the motives of our refusal.

We departed from Constantinople with a very favourable wind the 11th Prarial on board a Turkish veſsel which we had freighted. We touched at the second castle at the Dardanelles, and at different parts of the Troad. For the second time we traversed this fertile country; we visited the soil of ancient Troy; we saw the springs of the Scamander; we coasted the banks of the Simois, and from thence went to see the ruins of Troy, and of Alexander; we stopped for half a day at Ipsera; we disembarked at Sunium to view the remains of the temple of Minerva; and we arrived at Athens the 17th of the same month. We did not remain twenty days in this town, which offers so many beautiful monuments, and which recalls to memory so many great actions. I bring with me plans of the ancient and modern towns done by Fauvel, and that of Marathon, which I traced myself on the spot; I have collected materials concerning the present state of Athens and its environs, in order to form comparisons with what it formerly was. I have seen mount Hymethus, the marble quarries of Pentelicus, the cities of Eleusis and Megara. We have croſsed the straits of Salaminé, where the Persian fleet was destroyed, and we traversed the Isthmus to re-embark on the gulph of Lepanto, from whence we went to Patras.

It was time to terminate our observations on the Ottoman empire, and to quit these countries now in a state of barbarism, but which were formerly the seat of the arts, science, and philosophy; it was time for us to place ourselves under the ægis of the republic. We arrived at Corfu the 26th of Meſsidor, after having touched at Cephalonia, Ithaca, and Parga. Our quarantine lasted twenty-one days, it was not finished, when we began to think of returning through Italy in spite of the embarraſsment of a considerable collection, when the citizen Comegras, commiſsary general of the directory, arrived. We addreſsed ourselves instantly to him to request the means of gaining Ancona. For some time he gave us hopes that he would give us a demi galley belonging to the republic; in the mean time I visited the island and its environs, sometimes alone, at others with my companion, to inquire into the natural productions of this country, on the state of its agriculture, and what improvements might be made to it on the roads and harbours, on the ship timber of Epirus, on the commerce of the country, on the manner and opinions of these new Frenchmen. I gave to citizen Comegras, the 6th and 19th Fructidor, two memorials, which are connected with each other, for him to transmit them to the government.

We set sail on board the frigate La Brune the 23d of the same month for Butrento, where we paſsed the day, and we arrived at Ancona the second complementary day. It was there that my colleague, who had been almost always unwell and in pain since our journey to Persia, terminated his career the 11th Vendemiaire of a putrid fever, the consequence of his fa-

tigues. He has left a family in distreſs, whom it is doubtleſs unneceſsary to recommend to the benevolence and justice of the government.

I have brought with me from these travels a considerable collection of plants, seeds, quadrupeds, birds, reptiles, river fishes, shells, minerals, medals, engraved stones, and other objects of antiquity. I have a few idols, and mummies of Egypt, a collection of simple drugs, the greater part of which are unknown; an aſsortment of medicines employed in Persia, and a few manuscripts, which are rare and precious.

I have just deposited in the national garden of plants seeds from Persia, Mesopotamia, the desert of Arabia, Syria, Cyprus, Asia Minor, and Greece, to be sown and cultivated; already a great number of those which we had before forwarded have come up and succeeded.

The following letter it has been thought proper to give to the public, as it respects a subject of deep interest to the nation at large at the present moment; and as it may poſsibly be the means of inducing some person to engage in the diſcuſsion that it suggests, should it not prove convenient to the noble lord to whom it is addreſsed to do so. Perhaps such questions may be best elucidated by being diſcuſsed by a variety of persons.

To the Right Honourable Lord Sheffield.

MY LORD,

I HAVE been honoured with your lordship's letter of the 23d ultimo, and am glad to be informed that you are about to publish another edition of your pamphlet, on the Causes of the Present Scar-

city, with considerable additions; for, so few of the writers who have treated that subject have considered it under what I conceive to be a proper point of view, that I rejoice to think that your lordship's pamphlet, by having an extensive circulation, may tend to correct many erroneous notions that have gone abroad on that subject. If, on the perusal of that publication any thing in it had struck me as erroneous or inaccurate, I should readily have availed myself of the permiſsion which you obligingly give to point it out; but this not having being the case in regard to any particulars of importance, I have only to expreſs my wish that it may meet with all the attention it deserves.

I have had a strong desire to continue my "Calm Investigation into the causes of the present Scarcity," so as to give a connected view of the other circumstances that have so powerfully concurred with the alteration in the corn laws to produce that deplorable change in the circumstances of this country which you have so properly taken notice of on various occasions. The circumstances of the times strongly call for it; but the prospects that result from the serious contemplation of these objects are so gloomy, and the reflection that my poor exertions can be productive of so little good, so forcibly strikes me, that I am discouraged from proceeding. Indeed, I can feel no other inducement to attempt the task than that which arises from the reflection that it is a duty we all owe to posterity, each to exert himself in his station as much as is within his power, to ward off evils that threaten, and which are clearly within his perception.

Your lordship justly observes, that agricultural exertions are strongly repreſsed by a variety of circumstances which affect this country, all tending to one point. Among these, tythe *in kind* is conspicuously prominent; yet, though most persons admit that it is an evil, few in this country seem to consider the evil as of one hundredth part the magnitude that it really is; and therefore think, that, although it might perhaps be better otherwise, the danger of the attempt to amend it outruns the benefit that might be derived from it: nay, some men's judgments are so strangely warped, that they are not seriously convinced that it is at all an evil. Not many years ago, when I was at the pains to digest a plan for the commutation of tythe, which was so obviously favourable to the tythe owners, that it would have undoubtedly nearly doubled their income over the whole kingdom, and which has since been published in the third volume of Eſsays on Agriculture, I was anxious to know if any valid objections could be made to it; and, with a view to discover that before publication, I used the freedom to request the opinion of an eminent prelate, of whose talents and dispositions I had been made to entertain a favourable opinion. His lordship had the condescension to peruse the MS. on which he made a few polite observations; but he concluded by saying, "that it was unneceſsary for him to go to greater length on that subject; since it was his serious opinion, *that the drawing of tythe in kind could in no sense prove obstructive to the production of corn in this country!*" If this be the case with one man of eminence, no wonder if others of leſser note, swayed by his opinion, should think as

he does; so that it is not, perhaps, so unnecesary as you may think it is, even at this day, to point out the accumulated evils which result from that institution; under the effects of which the public at large so deeply suffer at the present moment.

I hope your lordship will peruse Mr. Dirom's work with great attention; for, though it cannot attract by the allurements of style and fine writing, you will there find much sound sense and judicious information; particularly respecting the machinations of corn dealers, who, if they can but get the power continued in their hands (as they have at present) will inevitably prevent this country from ever experiencing the comforts of plenty. The present crop is, I think, without exception, the best that has been obtained over the whole of this country in my time; yet I have not the most distant expectation that prices will be reduced to nearly their former standard by it, though the derangements that will result to the mercantile world from the small reduction of price that must and will take place, will be such as to produce much noise and distres to individuals, and trouble, I doubt not, to the legislature.

These, however, are not the only causes that have tended to discourage agriculture and diminish the produce of this country. The poor's rate, and the practices that have in some measure grown out of that institution, conjoined with other unobserved circumstances, have concurred most powerfully to augment the evil. In every period of our history, there has been some popular phrenzy prevalent. At one time, the word *colonies* obtained an ascendancy over every

thing; and now *manufactures* and *trade*, as being the sinews of war, are all and all in the eyes of those who look only to the present moment; and to the interest of these favoured idols agriculture must become subservient. Laws have been made to compel the farmers to support the poor, as they are called; that is, the idle and dissipated part of the community; by which laws a certain set of men are vested with almost unlimited power to put their hands into the pocket of the farmer when they will, and take from it what they please; with which money they are humane, generous, and liberal, even to profusion; so that, under the pretext of *feeding the poor*, the labourers are induced to become idle and drunken, and then of course poor, and their families reduced to rags and beggary; while the farmer finds it impossible to conduct his business properly, not only from the want of hands (as two do no more than one might easily do), but from the extravagant expence to which he is subjected. Where this will end no one can say; but it is easy to see, that a short-coming in the general produce of the country, in consequence of relaxed exertions, must first be felt, and in the next place a rise in the price of provisions. I shall beg leave to state the following facts, which will give some idea of the abuses that prevail in regard to this particular, and their consequences.

In the village where I now reside, there lives a man who has a fixed income of twelve pounds ten shillings a year, with a new coat, arising from a sinecure office that he holds. He has moreover another fixed income of twelve shillings a week, regularly paid to him. Be-

sides all this, he follows an employment, which either does, or ought to afford him a comfortable subsistence, as many others support themselves well by it. He is not, I suppose, much above fifty years of age; is neither maimed nor liable to any disease, unleſs drunkenneſs be reckoned such. He has neither wife nor child to support, *and this man receives money from the parish!!!*

The other case does not, indeed, come within my own knowledge; but I had it from a gentleman who knew the parties, and who is one of the most circumspect persons I know in his narrations; so that I can have no doubt of the fact. A gentleman who inherited a small property, which, when it came into his poſseſsion, rented at one hundred pounds a year, took it into his head to farm it himself. After some years' trial, not finding the profits equal to his expectations, he wished to let it; but he could not find one who would engage to pay the old rent for a continuance of time, from a dread of the poor's rates, which, upon the decline of a particular manufacture in the parish, were rapidly on the increase; at length, however, he found a tenant who was content to give him the old rent, provided the land-owner would insure him that the poor's rate should never exceed 12 shillings in the pound. This he agreed to do, taking the burden of paying the rates himself, if ever they should exceed that proportion. In a few years, however, the rates rose so rapidly, that, besides the 12 shillings in the pound paid by the tenant, the landlord was obliged to pay last year above a hundred pounds to the poor; so that, should this rate continue, he must finally abandon the estate, and leave the poor to make of it what they can.

This is an uncommon case; but there are many parishes at the present moment in which the rates exceed 25s. in the pound, and are daily rising higher and higher!

I have said above, that this poor rate is paid by the farmer; for, in truth, the proportion of it that is paid by any one else is so small as to be next to nothing; and therefore, by the bulk of the people (who are not landholders,) its exceſses are little regarded. A manufacturer, for example, whose income amounts to many thousand pounds a year, may perhaps be rated at 50l. rent; while a farmer, who has not one tenth of his income, is perhaps rated at 500l.

This heavy tax comes upon the tenant, it is true, in the first instance, and becomes to him a grievous oppreſsion; but no sooner does his lease expire than he counts upon the rate that he pays as rent, and throws it upon his landlord. But, afraid of rises of rate, he shuns entering into a long lease, without which he must be a dependant, comfortleſs being; and agricultural exertions will soon be at a stand. How can the country, under these circumstances, be productive?

These are evils which are felt, and deeply felt, though no one seems to be inclined to probe the wound to the bottom, so as to be able to effect a radical cure; and partial applications do no perceptible good. The compulsory poor's rates was, doubtleſs, an unwise measure from the beginning, as it sowed the seeds of abuses which must of neceſsity increase; but these abuses have become much greater than they might have been, had proper checks been provided to moderate them as they began to show themselves: this, however, having been neglected, injustice has at length been matured

into a system, which it will be difficult to destroy. At the time when the poor laws were first enacted, manufactures were comparatively of little avail in England; and in country places they were nothing. Almost all property might be said to consist in land; so that a rate proportioned to rent affected property pretty equally over the whole. Things are now much altered; and, of course, this mode of apportioning the rates has become unequal and unjust; yet no one has thought of making a modification of it. The consequence is, that those who chiefly pay the rate have come to be but a very small proportion of those who afsefs and manage it, and, of course, are unable to check abuses; so that these have multiplied to such a degree as to threaten destruction to the whole community. I only touch on this, my lord; but your lordship will easily perceive that it is a subject which requires to be enlarged upon; and I beg leave to recommend it to your attention; for, unlefs this shall be deliberately done, it is vain to think of applying remedies that do not reach the evil.

Changes in the state of society are generally effected by the silent operation of circumstances that are not, at first, observed to operate at all. When the evils originating from these circumstances come, at length, to be observed, the amount of the effects that will be produced by them is not, for a time, duly appreciated; so that these abuses are in some measure disregarded until they have obtained such a firm footing as to render any efforts to remove the evil unavailing. This remark will apply to many other particulars beside tithe and poor's rates, all tending to diminish the quantity

and to augment the price of provisions in this country; which I am sensible it never will be in my power to cause to be duly adverted to. I should, therefore, be happy if your lordship would seriously apply your mind to that task, as your efforts might be more availing. With this view, I shall beg leave to suggest a few farther hints that occur to me on the occasion.

Your lordship well knows, that England, not long ago, was an agricultural country; and, though not perhaps the first of European states in this line, was yet among the foremost. At that period, landed property constituted the principal wealth of the nation; the holders of that property had, of course, a principal share of power in the state; and the exertions of the most active part of the community were directed towards rural improvement. Men of all ranks looked towards that quarter for their principal support; and from that quarter chiefly were derived the sources of revenue, and the energies of the empire. From the superfluities of the productions of the land our commerce derived its first feeble beginnings; and manufactures, by degrees, drew their support from the same source; though both of them long languished under the impolitic restraints of injudicious fiscal regulations. A nascent trade, unprotected by those barriers which the circumstances of the times had enabled landholders to devise for the security of their property, offered facilities for the exertions of power in respect to revenue that were eagerly grasped at, and which laid the foundation of changes that became, in time, extremely important. The revenue that might be derived from foreign trade under a better regulated system of ma-

nagement did not, however, long escape the attention of the executive departments of government; in consequence of which, those who exercised the business of *commerce* obtained the favourable countenance of the servants of the crown, who were, in general, disposed to forward every project that was suggested to them as likely to prove favourable to the extension of trade. And, as neither ministers in general, nor landed proprietors, were capable of judging of the *real* tendency of many of the measures that were recommended by mercantile men with the alledged view of augmenting trade, it has happened that the legislature has been misled on innumerable occasions by plausible arguments adduced by interested individuals under that pretext, whose *real* tendency was extremely different from that which was alledged, and has been induced to enact laws and encourage speculations that have proved highly destructive to the empire. The parliamentary history of this country, were it to be compiled with a view to laying open the machinations of this sort, so as to discriminate between the real tendency and the *pretexts* under which laws have been enacted, would prove a curious, useful, and interesting performance: but this we may rather wish for, than ever hope to see. In some instances, it is true, these deceptions have been at length made manifest, and remedies applied to remove the evils which they had produced; but, for the most part, the popular cry which interested persons make it their study to encourage, has proved sufficient to drown the voice of reason long after the evil had become obvious to sensible men. Two striking instances of this were unveiled to the

public long ago with very little effect: one, respecting the commerce of wool, in a book called *Memoirs of Wool*, published by a Mr. Smith in the early part of the last century; which, though it contains a series of unanswerable proofs of the falsity of those pretexts which have been repeatedly adduced for the purpose of deceiving the legislature and imposing on the public, has not, even to the present moment, been sufficient to counteract the power of that sinister influence over the minds of a majority of the senators of this kingdom; though the time seems to be now near at hand, when it will be no longer posſible for them to keep the bubble from breaking in regard to this particular. The other instance is afforded by Mr. Dirom's book respecting the corn laws; which hath as yet produced no effect in checking the evil that it was intended to correct; although the circumstances of the times speak at present a language in this respect that ought to be irresistible, but which I am afraid will not be as yet sufficiently attended to. It is, indeed, to be regretted, that Mr. Dirom has contented himself with barely pointing out the system of deception that has been invariably pursued by corn-dealers in order to mislead the public mind, without entering into any explanation of the circumstances that have invariably induced them to do so; which, when developed, would clearly show that it could not be otherwise; and that they must continue to operate after the same manner with an undeviating steadineſs in all succeeding times. How careful then ought men to be to guard against the destructive effects of this pestiferous influence!

In consequence of the delusive influence of artful

and interested persons (who compaſs heaven and earth to gain proselytes) over the minds of the indolent and inconsiderate part of the community, the voice of truth, coming from a few nameleſs individuals, who can have no other motive to stimulate to exertion than a disinterested regard for the public weal, has been too feeble to be attended to; being drowned, like the voice of the king of France in his last moments, by the noise that was raised on purpose to stifle it. Yet, though its effects are lost for the present, it may perhaps, if communicated to the public, come, in time, to be adverted to, and thus may be eventually of some service to the human race.

Trade and *commerce* having, from the considerations above stated, become favoured objects with the servants of the crown under every administration, have had their praises so often sounded forth in the most lofty strains, that their very names have come at last to operate upon the minds of the populace like an eastern tilisman, that perverts the senses, and makes objects aſsume an appearance extremely different from the reality. Under the power of this fascinating influence, *colonisation* has long been encouraged by every mean that a deceptious policy could devise. Allurements have thus been held out to the people, to draw them from their innocent and beneficial occupations at home, in the hope of amaſsing wealth with a destructive rapidity in foreign climes; and, although hundreds die in the vain pursuit of that treasure which they never find, for one who attains it; yet *a few* do gain the prize, who, coming home, scatter plenty and destruction around them, by exciting a spirit of ambition and

discontent among their former acquaintance, which drives them from their sober retreats to meet death in search of wealth elsewhere.

Again. To defend the colonies, and protect trade, numerous fleets and armies are required. This lays open another source of ambition, which affords powerful allurements to draw the youth from the haunts of industry and peace, to those of rapine, disorder, and destruction, under a variety of forms. Manufactures too, as ministering to trade, lay in their claim for favour from the ruling powers; and the rapid acquisition of wealth which may thus at times be obtained, affords strong temptations for abstracting from agriculture a large proportion of the capital and industry which would otherwise have continued to flow in that channel; while the occasionally powerful, though unsteady, demand for hands to be employed in these manufactures call off from the plough immense multitudes of labourers, who are wanted for the proper cultivation of the soil. These, in consequence of the high wages they can at *some* times easily earn, soon fall into habits of dissipation and vice, so as to be reduced to want and beggary by the first stoppage of manufactures that occurs, and are thus thrown back upon the farmer for a support which they never could have required had they continued in the practice of industrious sobriety in his service.

These circumstances, all co-operating, must have a powerful tendency to repress agricultural exertion, to diminish of course the production of corn in this country, and to enhance its price; at the same time that it lowers the income of landed proprietors, and lessens their proportional weight and influence in the state.

In the mean time, in consequence of wars, and other inevitable expences that result from extended empire, taxes are neceſsarily multiplied, and the national debt accumulated by an irregular though rapid progreſsion; which, among other unavoidable consequences, produces a depreſsion in the value of money that occasions derangements in the private economy of individuals; the cause of which, not being known, is often ascribed to circumstances that have no sort of influence upon it; which only produces a few ineffectual and convulsive exertions to remove an evil that continues daily to gain ground.

Such has been the general train and progreſs of those changes which have taken place in the political state of this country for about a century past; and though these have had a continual tendency to depreſs agriculture, yet, in consequence of the judicious system of corn laws that was adopted soon after the revolution, such general security was given to the farmer, by affording to him a steady market at all times, as to stimulate his endeavours for the production of corn; and so long as this system was adhered to with tolerable steadineſs, it so far preponderated above all the other sinister influences, as to enable our farmers to raise not only abundance of corn for the sustenance of all the inhabitants of the empire, but also a great annual surplus, which at one time amounted to more than one million and a half of quarters of corn sold to foreign states, which furnished the means of an extensive trade that brought in a large balance of money in our favour. But, as if the demon of insanity had poſseſsed the nation, even at that time the *tocsin* was sounded,

and manufacturers cried out from all quarters that they were in danger of being ruined by the extortion of the farmers; and that the national treasure was exhausted by an unjust bounty paid to them, which only tended to enhance the price of grain. At that very instant, when corn had been brought by a gradual abatement to sell for lefs than half its former price, though every other article had greatly advanced in price during the same period; yet at that very instant, in spite of this glaring fact, which stared every man in the face who reflected for one moment on the subject; it was determined by the decree of those who thought themselves *wise*, that the price of corn should be still farther diminished; and that farmers should be compelled to furnish it at that price, whether they could afford it or not. What was the consequence of this wise procedure? What might have been naturally expected. Farmers, from being deprived of the only resource that could enable them to sell corn cheap, (viz. a steady and certain market at all times at a reasonable price), slackened their exertions; and, as the expence of producing corn was greatly enhanced to themselves, in consequence of the increase of wages, augmentation of poor's rates, and rise of rents, they were forced, to a certain degree, to abandon that line of businefs, and apply themselves to others, until the quantity of corn produced fell so far short as to occasion first a rise of price, and then an importation from abroad; a circumstance which must ever tend to enhance the price still more and more in proportion to its amount. [How exactly the rise of price of corn keeps pace with the amount

of importation, and its fall with that of exportation, the reader may see if he will take the trouble to glance his eye over the table of exports and imports of grain during the last century, published in the pamphlet entitled a "Calm Investigation into the causes of the present Scarcity." CUMMING.]

In forwarding these *blessed* effects, the drawing of tythe in kind has come in for its full share, and has operated powerfully: so powerfully, indeed, that innumerable fields are now not only turned into grafs, merely for the purpose of avoiding to pay a *corn* tythe; but some farms have even been, on that account, totally abandoned; as is notoriously the case with a farm not ten miles from the place where I write, which has been left *entirely unoccupied* for more than fifteen years past; nor is this the only instance of the kind that I have heard of.

And what is now doing to remedy these evils? Premiums have been held out by parliament for the *im*portation of corn, on a plan that, without having produced the effect desired, will demand from the state such a sum of money to pay them, as will amount *in the course of one year* to as much as would have been nearly enough to have fed half the people in the island at the low price that grain had been brought to by the operation of the corn laws, and which, we have seen, has not been sufficient to moderate the price of corn during the time of these high importations, though it must now tend greatly to derange the economy of the state in a variety of ways. It deserves likewise to be specially remarked, that the monies thus paid to encourage a feverish *im*portation will amount in the

course of one year only to as much nearly as was paid for the bounty during the course of half a century when *ex*portation was encouraged!

To repay the amazing sums of money thus expended, additional taxes must be imposed; which, according to the system now adopted, will preſs peculiarly hard upon land-owners in particular; while the poor's rates are doubled upon the farmers; by whieh means the expence of rearing corn in future must be neceſsarily enhanced much above what it was before. The price of grain must, of course, continue high, in spite of the most favourable seasons that can come. The mode of supplying the deficiency by encouraging importations from abroad, indeed, must tend to diminish still more the produce of this country; for the uncertainty respecting the state of the markets that must ever prevail while these are under the influence of extensive corn dealers, the vexation of tythes, and the unlimited increase of poor's rates, must induce the farmer to abandon the plough still more than he has done, an occupation that is only productive of vexation and perpetual haraſsments, and make him betake himself to some other employment in which he can live with comfort as a respectable member of society.

I touch on these things, my lord, only with a rapid sweep, and merely to bring them under your view on the present occasion. They deserve to be enlarged upon, and distinctly explained. Many other particulars of importance remain to be pointed out. But the enormous length of this letter forbids me to mention more than the following; which I conceive to be of

too material importance to be overlooked on the present occcaion.

It appears to me that one circumstance that has tended powerfully to derange the political economy of this nation, and augment the evils of which we now complain, and that has entirely escaped the notice of writers on this subject, is, the practice which now generally prevails in England, of paying rents in *money* only. It is well known, that formerly, rents were paid partly in money, but chiefly *in kind*. The consequence was, while this practice prevailed, that a variation in the value of money produced but little change in the income of landed proprietors. Hence it happened, that the short-sighted policy of debasing the coin, and thus altering the value of the same denominations of money, though originally intended by the princes of Europe to fill their own coffers at the expence of others, did in effect produce little other change than that of ultimately diminishing their own income, by lowering the value of monies collected for fiscal purposes, and that of raising the nominal price of all other commodities. Few persons, therefore, found it then to be a real grievance, or complained of the evils originating from that source; although there can be no doubt that it did produce some temporary derangements that proved embarrafsing to individuals to a certain degree. Under the present state of things, however, political arrangements that tend to alter the value of money are attended with evils of a much more serious nature; and I confefs, that it has often appeared astonishing to me, that men of landed property, especially, should so long have been totally regardlefs

of this circumstance, as every individual among them has felt, and deeply felt, the consequences of it.

It is true, no minister at the present time would dare to alter the alloy of the current coin, or diminish its weight. Every idea of that sort has been long ago exploded. But what could not be done directly, has, in fact, been effected by indirect means in our day. Every person who has bestowed the smallest attention to financial concerns must know, that whatever addition is made to the funded debt of the nation must as necefsarily diminish the value of the money of the country as would be effected by a diminution of its weight, or an augmentation of the alloy of the current coins. The effects of the one are equally certain as those of the other; though it is only a few persons, who have made this department of science their particular study, that can distinctly trace the manner in which these effects must be produced. Hence it has happened (and we all know in fact that it has happened,) that the value of money has been continually on the decrease in Britain, from the revolution to the present day, although the coins have remained since that time unaltered.

Men of landed property feel this (and I shall soon take occasion to point out the effects of these feelings;) but they do not think of applying the proper remedy. They are daily seen to vote for an augmentation of the national debt, with a careleſs unconcern, which plainly shows that they are not aware that every such vote has a neceſsary tendency to diminish their own income in various ways, while it does not affect in an equal degree the income of most other members of the com-

munity. As if this evil, however were not, of itself, a sufficient encroachment on their property, they have seen of late, with an equal degree of apathy, another political arrangement adopted, that has tended greatly to augment that evil, under the preſsure of which they already suffer severely, and must suffer much more severely still, unleſs some adequate remedy shall be applied to it.—I here allude to the order for making money-payments by the bank of England optional. But I must not enlarge on this topic, as it may be considered here as merely a digreſsion. I therefore return to my subject.

In consequence of this continually decreasing value of money, men of property in land find that their rents, if nominally stationary, are, in fact, perpetually on the decline: at some times in a very rapid degree, though at other times more slowly. They are, therefore, anxious to have their rents raised at short intervals, in order to make up for this deficiency. This, every man who considers the case impartially will say is just and reasonable, if it can only be duly apportioned to the circumstances of the case; but here arises a difficulty that is productive of much evil. As no man can say what will be the ratio of decrease in the value of money in a given period of time, so no one can fix with certainty the rise of rent that would be just and reasonable in a given period of years. And, as there are two parties interested in this transaction in opposite ways, it is scarcely poſsible that they can ever agree respecting it; the landlord always thinking that he should get more than the tenant will judge expedient. To get rid of this inconvenience, proprietors

in general are, with good reason, averse to grant leases for a long term of years at a fixed rent. But, without a long lease, spirited agricultural exertions by a farmer are altogether impoſsible. This circumstance alone would prove an insurmountable obstruction to the progreſs of agriculture, were none other to co-operate with it: for, what man of sense, poſseſsing a spirit of enterprise and independence, and having a capital sufficient to stock a farm in a proper manner, would ever think of laying out that capital on the property of another, and bestowing those exertions of which he is capable to carry forwards neceſsary improvements, where he has no security to prevent another from slipping in and reaping the fruits of his labour, or to prevent his family from being turned out of house and home, leaving great part of his property behind him, whenever it shall please the caprice of another person to order it so? It is idle to think that any man in his senses would do so; more especially when he sees that wealth and independence are within his reach by similar exertions in another line of buſineſs. He therefore, under these circumstances, either farms not at all, or adopts a plan to let things go on as they may in a slovenly manner, under which management the soil can never be made to yield one half the produce that it might easily be made to do. Of course, it can neither afford subsistence to nearly the same number of persons that it might support, nor yield to the landlord a rent nearly adequate to that which the soil was by nature fitted to afford.

Had rents, however, continued to be still paid chiefly *in kind*, as they heretofore were, the case would have

been very different. The amount of income to be derived from land would in that case have been little affected by a variation in the value of money, and the consequent rise in the price of corn and other articles. The landlord would not, of course, have felt the same aversion to the granting of leases that he now does; and the tenant, by being thus secured in the poſſeſsion of his land for a long period of years, would have found it to be for his own interest to cultivate land for corn in the most perfect manner that he could, and thus to render it more and more productive, as it neceſsarily must be in a series of years under a judicious system of spirited management. He would have found himself even in some measure neceſsitated to bend his attention towards the production of corn crops, in order that he might be enabled to pay the rent *in kind* which he had stipulated to do. Thus abundance at all times, if pernicious laws did not prevent it, must have been aſsured to the nation.

Instead of this, the farmer, as things are now circumstanced, finds it in general easier, and safer for himself, rather to try to diminish his expences than to augment the produce of his farm. With this view, he throws his land chiefly into graſs, instead of continuing it under tillage. By this mode of procedure he is enabled not only to diminish extremely the number of his servants and labouring cattle; but he also frees himself from the load of a corn tythe, and the risk that he would run of having his family ruined by being ejected from his corn farm, when his capital could not be recovered from it in several years. In a graſs farm, a short lease is of leſs importance; his ca-

pital is chiefly laid out on live stock, which can in general be converted into money with profit as the seasons come round. Being thus prepared to remove, without risk of losing his capital, at a very short notice, he is under no apprehensions of being ruined by a rise of rent or poor's rates; for whenever these become oppressive to him, he can quit and go elsewhere. All circumstances, therefore, concur in rendering a grass farm, in the present state of the country, more eligible than a corn farm; and, of course, many farms are abstracted from tillage. The produce of the land, it is true, in as far as respects the food of man, is thus prodigiously diminished; yet the profit in money may be to the farmer himself greater than it was before. He is therefore enabled to pay more rent for grass than corn land. This equally pleases the landlord and the tenant: it is the public only that ultimately suffers by this change. Ought not the public, then, to try to guard against these obvious evils? How this is best to be done I do not at present stop to inquire. I shall only here briefly remark, that, had the rent been payable chiefly *in kind*, this change could not so easily have been effected.

I am fully aware, that tenants would strongly object, in general, to pay any part of their rents in kind; and, after things have been brought to the state in which they now stand, it would, I am sensible, be an arduous task to bring them back to that situation which has been so long abandoned. Yet the benefits that would result to the community, were this arrangement adopted, are such as to make it ardently to be wished for. In truth, there appears to me to be but one valid

objection against it on the tenant's side, if he is to keep a strict eye to equity; which is, the trouble that farmers would find in delivering grain where they themselves are not the seller; and this difficulty might be easily obviated, by merely ascertaining, by a legal inquest once a year, what should be the fair average price of corn of every denomination in each county for that year, and making the tenants accountable for that price in money for all the rent corn that they did not find it convenient for them to deliver. It is no part of my intention, however, at present to enter farther into this disquisition than barely to state what have been the consequences of the arrangements that actually do exist, without entering into a particular examination of the manner in which the evils that have sprung from these arrangements may best be remedied. This would give room for a separate disquisition.

One other consequence that naturally results from the practice of abandoning the plough, and converting arable into permanent grafs land, I shall beg leave briefly to state, before I conclude this very long epistle: it is, the vast facility which this order of things affords for the engrofsing of farms and encouraging a destructive spirit of monopoly in many respects. Under the system of *aration*, farms are of neceſsity confined to a moderate size; nor can men with immense capitals engage in that buſineſs with a reasonable proſpect of ſucceſs, because agricultural operations, when attempted upon a *very large* scale, cannot be carried on with the requisite economy. The habits of a man of great fortune prevent him from seeing every thing

with his own eyes; and when the business is delegated to others, there must be great and unavoidable failures. This reasoning does not apply to a grass farm. The amount of capital in the undertaker is almost the only circumstance that need regulate the extent of the farm. If that capital be sufficient, one man may, without impropriety, under some kinds of grass management, farm half a county. But an immense capital, when thus applied, affords, in a variety of ways, facilities for monopolising that cannot be resisted. By that means markets may in many respects be regulated almost at will. Indeed, the power of vesting immense capitals in any business that concerns the necessaries of life, is one of the greatest evils that have originated from the encouragement of the mercantile system in this country; and every political arrangement that leads to this practice is highly detrimental to the public weal. The people at large are thus subjected to all the evils which originate in the power which these capitals confer, not only of withholding from the market necessary articles, and thus enhancing the price beyond all reasonable bounds, but even of modulating laws in their formation, and of evading them in their execution. Have we not all seen the very judges themselves braved in the seat of justice by a culprit of this description! This is an evil that ought to be repressed; but it will not be easily done. On this plan, a few farmers may become immoderately wealthy, while agriculture, properly so called, is depressed extremely; and the business of cultivating land will be of necessity abandoned by those who have industry and skill to prosecute that employment, that they may

try to earn a subsistence in some other more favoured employment; while, in their stead, the land is occupied by men who know nothing else than how to make money breed money out of the neceſsities of the people. Whether this be not already in some measure the case, whether there be not a prospect that it will become more so, and whether a system of mercantile speculations in corn upon the same basis be not already in a fair train of maturation, deserves to be inquired into. Nor do I know a subject more befitting your lordship's station and abilities than such an investigation.

I beg pardon, my lord, for having troubled you with such a long letter. The subject is interesting to me—I doubt not but it will be so to you; and it ought to be so to every one who duly considers it. Should these cursory hints induce your lordship to enter fully into this discuſsion, so as to illustrate the subject with your wonted perspicuity, my object will be fully accomplished. I have the honour to be, my lord, with due respect, your lordship's most obedient servant,

JAMES ANDERSON.

The following instructions, drawn up by the Emperor Mahommed Akber, a prince of great celebrity, who reigned in Hindostan from the year 1556 to 1605, will serve to give the reader a more perfect idea of the spirit that influenced the actions of that eastern potentate than could be conveyed by any historical description that could be given of it. A similar principle of order, beneficence, and economy, pervades all the other regulations of that prince, which are dis-

played in the Ayeen Akbery, translated by Mr. Gladwin, from which this is extracted.

INSTRUCTIONS FOR THE OFFICERS.

The Sepahsillar (or Viceroy.)

He is his majesty's vicegerent. The troops and subjects of the soobah are under his orders; and the prosperity thereof depends upon his impartial distribution of justice. In all his actions he must strive to please the Deity, to whose throne it is his duty to be incessantly offering up supplication and praise. He must constantly keep in view the happineſs of the people, and never suffer himself to be negligent in buſineſs. He must not talk idly, nor shew an unpleasant countenance. He must be circumspect in his conduct, and pay due regard to the rank of every one, shewing particular complacency towards them who are nearest him in office, nor neglecting those whose duty engages them at a distance from his person. Whatever can be transacted by his servants he shall not commit to the care of his sons; neither shall he employ himself upon a buſineſs which can be performed by his children. On all occasions he shall consult with a person wiser than himself; or if such an one is not to be found, he shall aſsociate together several of approved wisdom, and deliberate with them, listening with attention to the opinion of each, and determining with caution.

VERSE.

"Sometimes an old wise man may counsel fool-

" ishly; and an ignorant boy may, through mistake, " drive the arrow into the butt."

He must not admit every one to his counsel, nor low people in particular, since few advise from motives of friendship and disinterestedneſs. Considering his office to be that of a guardian, let him act with the utmost caution. He must regard the knowledge of the dispositions of men as the firmest basis of his power, and, having obtained that, he will live in perfect security. Let him keep under the command of reason, both his favour and his displeasure. The disobedient he shall strive to reclaim by good advice. If that fail, let him punish with reprimands, threats, imprisonment, stripes, or even amputation of limbs; but he shall not take away life till after the most mature deliberation. He must not stain his tongue with abuse, for foul language belongeth to low and inconsiderate people. Let him not make a practice of affirming his words with an oath, for he will thereby make himself suspected for a liar, and fill his hearers with distrust. In judicial investigations, let him not be satisfied with witneſses and oaths, but make repeated and various inquiries, and pay due attention to physiognomy. He must not intrust these investigations so entirely to another as to consider himself freed from all responsibility therein.

VERSE.

" Refer not his cause to the investigation of the " dewan, for poſsibly his complaint is against the " dewan."

Those who apply for justice, let them not be afflicted with delay and expectation. Let him shut his eyes against offences, and accept the excuse of the penitent. Let him behave himself with befitting state and munificence. Let him object to no one on account of his religion or sect. Let him intrust each division of the country to the care of an honest upright man. Let the roads be made safe by stationing proper guards for the protection of the traveller, and let him continually receive information thereof. Let him appoint to offices men of worth, foresight, and integrity, and not such as are avaricious; and if a sufficient number of such people are not to be found, he shall join in office several who are not acquainted or connected together; and writing down the representation of each, he must endeavour to discover the truth. Let his expences always be lefs than his income; and of what remains he should give some part to the needy, particularly those who do not set forth their wants. Let him be always attentive to the discipline of the troops, and see that their arms be kept in good order; and he shall constantly exercise himself and his men in riding, and in shooting with the bow and the matchlock. Let him be circumspect and deliberate in placing confidence, for many who are evil-minded carry a fair outside, and use the language of friendship; but as their profefsions are void of sincerity, they conclude with acting a vicious part. Let him strife to increase cultivation and population, and gain the hearts of all our subjects by a faithful performance of his engagements; and let him consider it is his duty to befriend the industrious husbandman. Let him be careful to appoint impar-

tial collectors of the revenues, and be always watchful over their conduct. He must give attention to the digging of reservoirs, wells, and water-courses; to the planting of gardens; to the erecting serais, and other pious and useful foundations; and see that such as have fallen into decay be repaired. He must not be fond of retirement, nor indulge himself in melancholy; neither ought he to be familiar with the populace, nor always in a crowd.

VERSE.

"Neither aſsociate with every one; nor separate "yourself from every one. Go in the road of wis- "dom, and be neither a fly nor a phœnix."

Let him venerate those who devote their lives to the service of God, and respect the dervishes and truly pious mendicants. Let him not consider imploring bleſsings from the sun and venerating lamps as ignicoly. Let him accustom himself to watching, and sleep and eat with moderation. Let him employ himself in prayer at sunrise, noon, evening, and midnight. When he is at leisure from religious and worldly duties, he should peruse books of philosophy, and guide his actions by their precepts. If he is not in a temper of mind to relish this study, he may read the Musneevy, regardleſs of the letter, but considering the spirit of the author. He ought also to cultivate his mind with the approved tales of the Keleilah Dumnah, thus making the experience of ancient times his own. Let him listen to true theology, and not give attention to idle tales. Let him aſsociate with the wise, and those of good and friendly disposition; and, having selected

from amongst them a man of truth and integrity, direct him to give due attention to all his actions, in order that whatever appears improper to him may be represented by him in private. If at any time he misconceives a motive or action, he shall not therefore be displeased at him, for it has long been matter of complaint that people are backward in speaking any thing that may be disagreeable to their superiors, and that it is difficult to find one who will benefit another to his own injury. Let him not be hurried away by the representation of slanderers, but exert his own circumspection on all occasions, because men of bad character forge stories; and, paſsing themselves off for men of integrity and disinterestedneſs, labour to injure others. Let him not be revengeful, but behave with modesty and kindneſs to every one. He must not slight the descendants of ancient families, but consider the glorious actions of their ancestors as the recommendation of their leſs deserving posterity. Let him observe that at meals every person says *Allah Akber*, and that the principal man amongst them answers *Jelle-jelalehoo*. Let him see that neither a goat nor a sheep be killed that is not a twelve-month old. For a month following the anniversary of his birth-day, he shall abstain from eating flesh; neither shall he eat of any thing that himself hath slain. Let him not addict himself to sensual gratifications; nor have commerce with a pregnant woman. The food which is usually given away after the death of a person, he shall prepare every year on his own birth-day, and bestow upon the needy.

Upon the sun's entering a sign of the zodiac, let

him employ himself in prayer, and discharge cannon and musketry, to apprize the populace thereof. And let him order the kettle-drum to be beat at sunrise and midnight. Let him not consider himself as stationary, but hold himself and family in readineſs to repair to the presence at the shortest summons.

The Foujdar (or General).

For the further prosperity of the empire, his majesty, in the same manner as he has appointed a Sepahsillar for every soobah, has nominated one of his intelligent and disinterested servants to the charge of several pergunnahs, who is stiled Foujdar; he is under the orders of the Sepahsillar, to whom he is to give every aſsistance in his power.

Whenever a zemeendar, or a collector of the royal or Jageer lands is disobedient, he shall endeavour to bring him back to his duty by fair words; and if they fail of producing the desired effect, he shall take down in writing an account of his proceedings, in the presence of the principal officers of government, and then inflict a proper punishment. If a number confederate together, let him fix his quarters near to their abode, and poſseſs himself of their men and property by degrees, without hazarding a general engagement. For a service which can be effected by infantry, he shall not employ cavalry. He must not be precipitate in attacking a fort, but encamp his troops beyond the reach of its guns, and block up all the avenues thereto. He must be guarded against their nightly sallies; and he ought to provide a safe retreat for himself. Let him be careful that the troops are relieved regularly.

When he has poſſeſsed himself of the strong hold of the rebels, he must act with fidelity in the division of the plunder, a fifth part of which he shall send to the royal exchequer; and if after making the division there be any remainder, that shall also be the property of the state. Let him pay constant attention to the horses and accoutrements of the troops. If a trooper be without a horse, his comrades shall provide him with one at their joint expence. If a horse is killed in battle, the trooper is to be mounted again at the expence of government. He must send regularly to the presence a roll of the troops who are present, and of those who are absent. In all instances he must exert himself in carrying into execution the royal regulations.

The Meer Adul and the Cazy (or Judges).

Although it be the immediate duty of a monarch to receive complaints and administer justice, yet, seeing that it is not poſsible for one person to do every thing, it neceſsarily follows that he must delegate his power to another. This delegate must not be satisfied with witneſses and oaths, but make diligent investigation; because it is very difficult to come at the truth without painful search and minute inquiry. Considering the depravity of human nature, he ought not to place much reliance on depositions and solemn aſseverations. Divesting himself of partiality and avarice, let him distinguish the oppreſsed from the oppreſsor; and when he has discovered the truth, act accordingly. He shall begin with asking the circumstances of the case, and then try it in all its parts. He must examine each

witneſs separately upon the same point, and write down their respective evidences. Since these objects can only be effectually obtained by deliberateneſs, intelligence, and deep reflection, they will sometimes require that the cause should be tried again from the beginning; and, from the similarity or disagreement, he may be enabled to arrive at the truth. The Cazy tries the cause; and the person who paſses sentence and orders punishment, is called the Meer Adul.

The Cootwal (or Superintendant of the Police).

This office requires one who is courageous, experienced, active, and of quick comprehension. He must be particularly attentive to the nightly patroles, that, from a confidence in his vigilance, the inhabitants of the city may sleep at ease, and every attempt of the wicked be prevented or frustrated. It is his duty to keep a register of all the houses and frequented roads. And he shall cause the inhabitants to enter into engagements to aid and aſsist, and to be partakers in the joy or sorrow of each other. And he shall divide the city into mehals (or quarters), and to nominate a proper person to the superintendance thereof, under whose seal he shall receive a journal of whatever comes in or goes out of that quarter, together with every other information regarding it. He shall also appoint for inspectors over the conduct of the Meer Mehal, a person of that quarter, and another who is unknown to him; and keeping their reports in writing, be guided thereby. Travellers, whose persons are not known, he shall cause to alight at a separate serai; and he shall employ intelligent people to discover who they are. He must

carefully attend to the income and expences of every man. His own conduct must be upright and strictly honest; and he must make himself acquainted with every transaction. Out of each class of artificers he shall select one to be at their head, and appoint another their broker for buying and selling, and regulate the busineſs of the claſs by their reports: and they shall regularly furnish him with journals attested by their respective seals. He shall endeavour to keep free from obstructions the small avenues and lanes, fix barriers at the entrances, and see that the streets are kept clean. When night is a little advanced, he shall hinder people from coming in and going out of the city. The idle he shall oblige to learn some art. He shall not permit any one forcibly to enter the house of another. He shall discover the thief and the stolen goods, or be himself answerable for the loſs. He shall not suffer any one to levy baj or tumgha, except upon arms, elephants, horses, goats, and manufactures; upon each of which something is taken, in every soobah, at one appointed place. He shall cause old coins to be melted at the mint, or pay them into the treasury as bullion. He shall be careful that the gold and silver coins of the present reign do not pass current at different rates; and upon coins short of weight, he shall take exactly the deficiency. He shall see that the market-prices are moderate; and not suffer any one to go out of the city to purchase grain; neither shall he allow the rich to buy more than is neceſsary for their own consumption. He shall examine the weights, and see that the seer be exactly thirty dams; and shall not suffer any other measure than the ilahee guz to be used. He

shall prohibit the making, drinking, selling, and buying of spitituous liquors; but need not take pains to discover what men do in secret. If any one die or disappear and leave no heir, he shall make an inventory of his effects, and take care of them. He shall see that particular ferries and wells are kept separate for the use of women only. He shall take care to employ trusty people in drawing water for supplying the public watercourses. He shall not permit women to ride on horseback. He shall take care that neither an ox, a horse, a buffalo, or a camel be slaughtered. He must not allow private people to confine the person of any one, nor admit of people being sold for slaves. He shall not allow a woman to be burnt contrary to her inclination. He shall not suffer any one to be empaled. He shall not permit any one to be circumcised under the age of twelve years; but after that period, they may be left to their own discretion. Let him expel from the city all hypocritical mallungees and calendars, or make them quit that course of life; but he must be careful not to molest recluse worshippers of the deity, nor to offer violence to those who resign themselves to poverty through religious principles. Let him see that butchers, those who wash dead bodies, and others who perform unclean offices, have their dwelling separate from other men, who should avoid the society of such stony-hearted, dark-minded wretches. Whosoever drinketh out of the same cup with an executioner, let one of his hands be cut off; or if he eateth of his kettle, deprive him of one of his fingers. Let him see that the cemetry be withoutside the city, in the western quarter. Let him prohibit the disciples from

mourning in blue vestments, ordering them to wear red clothes upon such occasions. From the first till the nineteenth of the month Feverdeen, during the whole of Aban, on the first day of every solar month, on festivals, on days of eclipses of the sun and moon, and on Sunday, let him prohibit men from slaying beasts, except it be for feeding animals used in hunting, or for sick people, as necessity may require. Let him have the place of execution withoutside the city. Let him see that the Ilahee festivals are duly observed; and on the night of the new year, and the 19th night of the month of Feverdeen to be celebrated with illuminations. On the eve of a festival, as well as on the festival itself, let him order a kettle-drum to be beat every three hours. He shall cause the Ilahee tarikh to be used in the Persian and Hindovee almanacs, observing that in the latter the month be made to begin from Kishenputch.

[*To be continued.*]

Index Indicatorius.

A Saunterer has favoured me with some observations on the operations going forward on Snow-hill, tending to show that the improvement there intended will prove much leſs beneficial to the public than that public had reason to expect, and requesting me to state the particulars he specifies, in hopes that they may still be attended to before it be too late. For my own part, however much I may be convinced of the justneſs of his observations myself, I am satisfied that any interference on my part would prove fruitleſs. From

the respect I bear for my correspondent, nowever, I shall state as briefly as I can the substance of his remarks.

He observes that the managers of that undertaking seem to be sensible that the first inclined plane that they projected was greatly too steep for the accommodation of the public, seeing they have abandoned it for the second plane that they are now making. This, however, he remarks, though a small matter better than the former, will still be greatly too steep for public convenience; nor indeed can it ever be made right without making a bridge over the hollow, and beginning the slope upwards from Holborn-hill, nearly opposite to Hatton-garden, where it now begins to descend. Were this done, the paſsage from Holborn to Newgate would be nearly as easy as any of the streets of London; which would be a benefit to the public of inestimable value. At the present time, he thinks, when application is to be made to parliament for extending the powers of the magistrates in regard to these particulars, it might be easily obtained; and he suggests, that were the intended street descending Snow-hill to be bent in a gentle sweep to the right hand, so as to bring it by an easy curve as it approached the line of Fleet-market, more in a line with the bottom of Holborn-hill, it would be perhaps more elegant, if the taste of the people of Bath, where curve lines are generally preferred, be admitted as a rule, and doubtleſs more convenient than any straight line there could be made. This would only encroach upon a few houses at present on Holborn-bridge, which, if purchased, and others rebuilt in a proper style along

the new street, would probably be repaid by the superior value of these new houses; and, as in this case some part of the houses in the lower part of Holborn-hill would be sunk below the level of the street, these, if purchased by the managers, might, without being taken down, have their walls heightened, and shops made on a level with the street; the lower floors being converted into cellars; which, together with the cellar room under the street (that would be cheapest raised upon arches) would go far to make indemnification for the expence. Paſsages might be left, if thought proper, under the bridge into Fleet-market from the inns in the lower parts of Snow-hill, should it be thought neceſsary to keep them up; and even from Holborn, by going a small space under the bridge, and into Fleet-market, if thought proper. This last paſsage might easily be effected through Shoe-lane if thought better.

In confirmation of the juſtneſs of my correspondent's ideas respecting the poſsibility of thus obtaining indemnification for the expence, I shall only remark, that the South-bridge at Edinburgh over the Cowgate, which was erected under the direction of a set of commiſsioners nominated in the act of parliament for that purpose, and that was carried on upon the plan here recommended of purchasing houses at their then value, and reselling them upon the improved plan, had the whole expence of constructing it fully repaid; and a considerable overplus of money left to be applied for other purposes.

I cannot help on this occasion strongly expreſsing my regret that something of this nature had not been

thought of when Blackfriars-bridge was built; for, had that been done, the conveniencies of the town might have been wonderfully augmented, its beauty improved, while a great saving in money might have accrued to the public. Had a bridge upon the plan here suggested been thrown over the hollow at the bottom of Ludgate-hill, and the street raised upon arches on each side of it, so as to bring it to a regular inclined plane from the bottom of Fetter-lane to St. Paul's Church-yard, it would have formed a gentle ascent that would have been scarcely perceptible. Had the street from thence to Blackfriars-bridge (now Bridge-street) been in like manner raised upon arches, so as to go with a regular ascent from thence to the top of the bridge, that ascent also would have been scarcely perceptible. The houses on Bridge-street would in that case have been much more airy and elegant than they now are, and consequently would have been of greater value; and the cellar-room under these houses, and the bridge, would have been of such value as to go far in the way of indemnification.

But this is only one item of the benefit that would have resulted from that plan. The sewer that runs under Bridge-street (formerly Fleet-ditch) is, upon the present plan, neceſsarily so low, that the bottom of it is beneath the level of the Thames at low water; a consequence of which is that at every tide the current in it is wholly stopped for several hours, which allows the dirt and silt to subside in it during that time; and there being no descent sufficient to occasion a rapid current to carry it off, it there accumulates to such a degree as to render it indispensably neceſsary to open

that immense sewer from time to time, in order to clean it out; an operation of inconceivable expence that must be frequently repeated. Many of my readers will recollect that a few years ago this operation was performed, and that it required two years to complete it, at a most enormous expence, and to the infinite prejudice and annoyance of the public. Had the plan above pointed out been adopted, the bottom of that sewer might have been raised to a level above that of the Thames at high water, and had the bottom of the sewer been of a proper construction to narrow the current as it fell lower, and had a proper ceſs-pool been made at the upper entry into it, the water might have flowed through that channel without ever having been incommoded by mud; as two or three persons paſsing along it at the time of the year when there was the least water in it, on purpose to remove any small obstructions that might have accidentally got there, would have been sufficient to keep it in good condition. Nothing was to prevent it from thus paſsing along the whole of Fleet-market; nor to raise it also on arches to the level of Bridge-street. What are the obstructions to prevent this from being still done?

Two letters have been received that are signed *T. H.* the first requesting some information respecting the proper mode of levelling high raised-up ridges of land, so as still to preserve the rich earth upon the top. He is thus informed that he will find pretty detailed directions for this purpose in the first volume of Eſsays relating to Agriculture and Rural Affairs. It is now near thirty years since that book was published, and I have nothing farther now to add to it from experience

than that it is neceſsary to be very particular not only to raise the old furrows at the first to a higher level than the former tops of the ridges; because the loose earth there accumulated sinks considerably; but that care should also be taken to loosen the earth in the middle of the old ridges to a considerable depth below the surface furrow, otherwise the water which sinks through the surface mould will be thrown into the old cavities of the furrows, so as to render the surface of the field for many years after unequally moist, which is always prejudicial. Indeed, this is one of the most expensive preparatory operations in agriculture, and can in no case be repaid but after a great number of years, so that those should deem themselves fortunate who have no occasion to resort to it; nor ought any one ever to attempt it who has not a long lease.

The farmer he mentions in his second letter appears to have some practical knowledge in this buſineſs. Lime is, in general, the most efficacious manure for that kind of land that can be universally commanded.

The other parts of his letter are not of general importance enough to admit of an answer in this place.

He ought to have adverted that the postage should have been paid, and that this might have been diminished, had it been sent to the care of Mr. Cumming, No. 40, Holborn-hill.

A correspondent has taken the trouble to send, all the way from Dublin, a strong philippic against Mr. Perkins and his metallic tractors, which he considers as one of the most shameleſs impositions that have been practised upon the public; with a great deal to the same purport that he wishes me to publish. For my

own part, I am far from considering Mr. Perkins's supposed discovery in the same serious light with my correspondent; I conceive it to be only one of those shifts that ingenuity will be ever devising to profit by the credulity of the public. John Bull is an honest, open-hearted kind of fellow, who, like most others of that description, stands in need of some amusement that will tend to keep up the play of his animal spirits; and, as nothing can prove ever so interesting to him as what concerns his own dear person, this will naturally occur as the most proper side on which his attention can be excited. Mr. Perkins has done nothing more than this; and in choosing his instrument, like many other magicians of the same sort who have preceded him, he has done nothing more than to adapt it to play upon the imagination more than on the senses. In this he has discovered ingenuity as well as dexterity. For these at least he is entitled to praise; and he must now have the satisfaction to feel that, if he demands from the credulous a premium for that ingenuity, he obtains it with the perfect good will of those from whom it is *subtracted*. It is probable he had read Shenston's works, in which he seems to have understood the full force of the following paſsage.

"It is poſsible, by means of glue, to connect two pieces of wood together; by a powerful cement, to join marble; by the mediation of a priest, to unite a man and a woman; but of all aſsociations the most effectual is between a fool and a knave. They become in a manner incorporate. The former seems so framed to admire and idolise the latter, that the latter may seize and devour him for his prey." Our ingenious ope-

rator seems to poſseſs none of the atrocity of mind indicated in the latter part of the sentence. It does not seem to be his intention to devour any one as his prey; he is contented with relieving them of a little uſeleſs droſs, in exchange for the satisfaction he gives them; and every one knows that "a fair exchange is no robbery."

There has lately, however, appeared in this country a necromancer of a much more powerful cast than Mr. Perkins, who, by means of drugs drawn from the mines of *Plutus* himself, has fascinated multitudes, so as to induce even the avaricious to divest themselves of their pelf, in order to enrich those for whom they care nothing. Whether it was with this view that the wonderful tunnel under the Thames near Greenwich was projected, and whether the effect will be as above stated, time will discover. But in my apprehension the *bottle-conjuror* was but a dwarf to this giant; although even this daring flight is nothing (though resting upon the same basis) to the *south-sea-bubble*, which made such a conspicuous figure in this nation in the year 1720. Let us then allow Mr. Perkins to play his humble game with impunity; it ought not so much to excite the indignation as the risibility of any one to observe the progreſs that he is making.

RECREATIONS

IN

AGRICULTURE, NATURAL-HISTORY,

ARTS,

AND

MISCELLANEOUS LITERATURE.

BY

JAMES ANDERSON, LLD.

FRS. and FSA. E.

Honourary member of the Society of Arts, Agriculture, &c. Bath; of the Philosophical Society, Manchester; of the Agricultural Society, Altringham; of the Philosophical Society, Newcastle; of the Society for promoting Natural History, London; of the Academy of Arts, Sciences, and Belles Lettres, Dijon; of the Royal Society of Agriculture, St. Petersburgh; of the Royal Economical Society, Berlin; of the Philosophical Society, Philadelphia; correspondent member of the Royal Society of Agriculture, Paris; and author of several performances.

KNOWLEDGE IS POWER. BACON.

VOL. V.

Being the First of the Second Series.



LONDON:

PRINTED BY T. BENSLEY,

Bolt Court, Fleet Street;

And sold by JOHN CUMMING, No. 40, Holborn Hill.

1801.

ERRATA IN VOL. V.

Page 178, line 21, *for* " house, especially during," *read* " house especially, during."
.... 190, line 5, *for* " cold air," *read* " inclosed air."
.... 190, line 9, *for* " be washed," read " be thus washed as it were."
.... 238, line 7 from bottom, *for* " Golionda," *read* " Golconda."
.... 277, Diagram, the flue B C should be open at top and bottom.
.... 284, Diagram, the pipes at A B D and F should be all open.
.... 297, line 2, *for* " manure," *read* " nature."
.... 316, Dele the whole of the first paragraph of Reading Memorandums.
.... 353, Diagram, the paſsage into the air-chamber B, from below the paſsage *e d*, should be open at both ends.

Omitted in the Index.

Tythe raises the price of corn, 412—and discourages industry, 413—one principal cause of the present scarcity, 428.
Tythe, the causes of the defects of that institution, 420.

The Binder is requested to substitute this Leaf for the Title-page given in Number 30.

32.

OCTOBER 1801.

RECREATIONS, &c.

N° 2. Second Series, Vol. II.

On the Symbolic Character.

[*Continued from page* 21.]

THE first idea that occurred to me when I began to examine whether it would be poſsible to devise a symbolic system of writing that should have no neceſsary connexion with the sound of words, was a natural consequence of those notions which have been so industriously propagated in Europe respecting the Chinese mode of writing, and which I am sensible will, from the same cause, occur to every literary person that shall read this memoir: it was, the difficulty, as I conceived it, that must be experienced on account of the immense multiplicity of characters that must be devised for this purpose; for, should it be even physically poſsible to invent these characters, which was not at all clear to me, it would be so long before those who tried to employ them could acquire a facility in doing it, that it might well deter any one from making the attempt. This was a neceſsary consequence of prejudices that I had imbibed from the vague opinions which Europeans have been made to entertain respecting the Chi-

nese characters; which besides, from the indeterminate notions that floated in my mind, I did not conceive could be made to expreſs all sorts of ideas with the requisite precision and accuracy. A very little reflection, however, was sufficient to satisfy me of the groundleſsneſs of this prejudice.

Every reflecting person must know, that it is as *easy* to devise a set of marks that can be cognisable by the *eye*, and to discriminate them accurately from each other, as it can be to contrive distinct differential sounds to denote the same things. We know, in fact, that it is much easier in many cases to mark nice differences by means of the eye with a definite precision, than can be done by the aid of any combinations of sounds whatever. In this way every one recognises the figure and features of a person whom he has remarked before; and can discriminate it readily from all others with an accuracy and precision that no description by the aid of words could ever enable him to do. Unleſs, then, it be inarticulate sounds expreſsive of violent sensations, which is the universal language of animated nature, that is known among all nations and tongues, and which constitutes no part of the written character in any nation, marks, cognisable by the eye alone, must be capable of denoting ideas with as much clearneſs and precision as any combination of articulate sounds ever can do.

Having advanced this first step in our progreſs, a consequence neceſsarily resulting from it was, that there never could be occasion for a greater number of *ocular* marks to denote our ideas than of articulate sounds to denote the same thing: but, since we all

know that it requires no greater stretch of talents than falls to the lot of almost every human being, to acquire such a knowledge of the *words* of his mother tongue as to enable him, without difficulty, to communicate his thoughts to another person when he pleases, the acquiring the knowledge of signs sufficient to denote all our ideas (with more or lefs precision, it is true, according as the ideas themselves are more or lefs distinct) cannot be accounted a very arduous task. So easy it is, indeed, that we meet with many persons who find no difficulty, at a very early period of life, in making themselves perfect in the use of five or six languages; in any one of which they can expreſs themselves with equal fluency and precision. Equally easy then must it aſsuredly be, to acquire the knowledge of a set of marks denoting words, as it can be to learn the sounds of those words arranged into syllables. Does not every person find as little difficulty in recognising the meaning of the character 2, as he does of the sound denoted by the letters TWO, or DEUX; or of the character & as that of the sounds denoted by the letters ET, or AND?

Proceeding in this train of investigation, the abſurdity of the notion commonly adopted, of the endleſs multiplicity of the signs employed by the Chinese in writing, became demonstrated. We find, in fact, that the number of words in all languages are circumscribed within such narrow limits as to be easily retained on the memory; and, on reflecting upon the subject, we perceive, that there are many devices for curtailing the number of words, for facilitating the attainment of their meaning, and for aſsisting the memory; most of

which are adopted in practice in every language, though, undoubtedly, in none, are *all* the means that might be adopted carried into practice. And, as all of these may be alike applicable to the language of signs as that of sounds, it will tend to render our notions of the poſsibility of acquiring a facility in this mode of notation the clearer, if we explain briefly a few of these contrivances.

All the words of every language may be arranged into a few general claſses, each of which poſseſses certain characteristics, and bears particular relations to certain other claſses of words which are nearly the same in all languages. This suggests a chain of connexion that tends greatly to abridge the number of words or signs that would have otherwise been indispensable, at the same time that it shows that the devices for this purpose that shall be adopted for one language will be found to be applicable, with little or no variation, to all others.

The first claſs of words, or signs, that commands our notice, is those which are used to denote the various objects that attract attention. These are what we know under the denomination of NAMES (or, in grammatical language, NOUNS), such as a man, a horse, a tree, a stone, &c. Each of these admits of certain modifications, according to the circumstances affecting them, which it would be foreign from our purpose here to enumerate. It only concerns us here to remark, that as each of these peculiarities must alike affect every name under the same circumstances, a small variation of a single word, letter, or mark, comes to denote an immense diversity of circumstances. This

is one step that has been adopted by all nations in the proceſs of facilitating the acquisition of languages.

Again: no object can exist without poſseſsing certain qualities. When the idea of that object, then, is suggested, either by the repetition of its name, or any visible mark denoting it, it may be neceſsary to specify some of those qualities for particular purposes. The object mentioned may be long or short, weak or strong, stiff or flexible, light or heavy, &c. &c. This claſs of words must also be found in all languages, as well as names, under whatever denomination they may be known (they are by us called ADJECTIVES); and, as the same quality may be connected with an immense variety of objects, this again suggests another ready means of abridging language. Thus the same word *(strong)* may apply to a great number of names; as a strong man, a strong horse, a strong beam, and so on.

In every language also there must be a numerous claſs of words which denote actions or movements of one sort or other; such as to walk, to run, to fly, and so on. These words we have called VERBS. And as every one of these actions may be represented either as being past, or as transacting at present, or as being only to take place in future, they all nearly alike admit of a great variety of modifications respecting time, &c.; so that one variation may be made equally to affect the whole; which furnishes another source for a great abridgement of the number of words that have been adopted, in one way or other, in all languages hitherto known.

From this claſs of words *(verbs)* originates another

claſs still of a subordinate nature, that have no other tendency than to denote the various modifications of which the motion or energy denoted by the verb is susceptible: thus, to walk, denotes a certain kind of progreſsive motion which may be either accelerated or retarded; we may, therefore, say to walk *quickly* or *slowly*, to run *lightly* or *heavily*, to knock *loudly* or *gently*, and so on. These words, in our language, have been called ADVERBS. In this instance, as in many others, it will appear, that one slight variation of a word comes to denote a general idea that is applicable to an indefinite number of circumstances; so as greatly to abridge the number of words.

It will be unneceſsary to proceed farther in this kind of analysis; as a single example will be sufficient to give an idea of the *manner* in which these circumstances tend to abridge the number of words, and to relieve the memory from the burdensome task of numerous recollections. The affection of the mind, which we denote by the word *love*, is universally known. In this state, the word, simply *love*, is a noun; *lovely* is an adjective denoting those qualities that are calculated to excite the sensation of love, as a *lovely* child: *to love* is a verb, and denotes that the sensation which we call love is actively exerted, so as to produce effects upon one object by another, admitting of numerous variations indicative of the different modifications of which it is susceptible respecting time, person, and gender; and, as all these variations are common to every verb, the acquiring the knowledge of these modifications for once gives a perfect knowledge of the meaning of an immense number of words

with very little burden to the memory. *Loving* belongs to a particular clafs of adjectives, which many grammarians have ranked as a variation of the verb, a *loving* wife. *Lovingly* is an adverb, denoting a particular modification of any action or energy denoted by the verb to which it neceſsarily must apply, he *spoke* to her *lovingly*. Thus, the single idea denoted by the word love, under different modifications, gives rise to a great diversity of words, the meaning of all of which are recognised with very little difficulty, because the similarity of the sound calls the attention to the primitive idea denoted by these sounds. The same general mode of aſsisting the memory in an immense multiplicity of words pervades all languages, notwithstanding that we meet with certain uneſsential peculiarities in each respecting the particular mode in which this is effected, which serves to difference them from each other, though it does not affect the radical principles of grammar in the smallest degree.

Other ways for still farther disburdening the memory in regard to the attainment of languages have been universally adopted; and it affords no small satisfaction to the well-informed philologist to trace the similarity that prevails in all languages in regard to this particular, however diversified the same words may be in regard to the dreſs in which they make their appearance. This is effected in some cases by forming a word that denotes abstract ideas from one that conveys a literal meaning, and from compounding words in a variety of ways. Thus, weight denotes the tendency of a body to decend towards the earth; the opposite to which is denoted by *lightness* or *levity*.

These are relative terms denoting proportional differences; hence we have derived the abstract phrase *weighty arguments*. Innumerable are the words of this clafs in all languages, and great is the perplexity that originates from the improper use of them. Compounds, such as *pen-knife*, *water-mill*, *wheel-barrow*, *mill-horse*, *horse-mill*, and so on, are equally numerous, all of them tending to relieve the memory, and diminish the number of words in every language. Other means there are of still farther diminishing the number of radical words, some of which have been adopted in regard to particular languages more than in others, but which might be equally applied to all in the formation of a new character, if deemed neceſsary; but on these I will not here enlarge. What has been said will, I hope, be deemed sufficient to show that the multiplicity of signs wanted can prove no real bar to the formation of a new character, should any person of adequate abilities apply his mind seriously to that task.

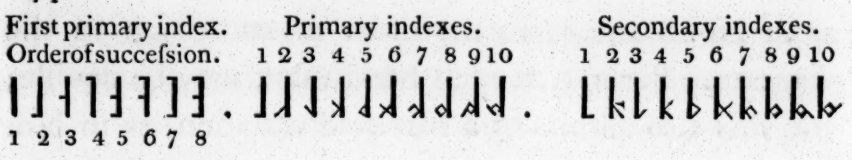
Having advanced thus far, the next consideration was to try if a mode could be devised for contriving a set of characters for the purpose that should be simple in their formation, and susceptible of being easily recognised from each other in all cases, though sufficiently numerous to answer all the purposes that ever can be required: and here also I found the difficulties much leſs than I had expected to encounter.

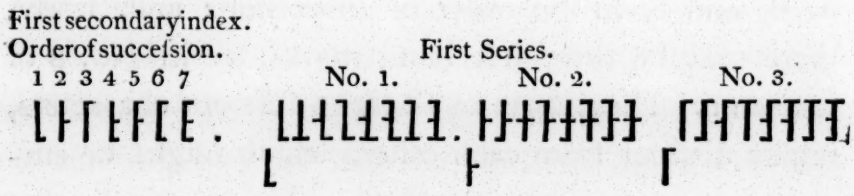
The most simple figure that I could think of was that of a downright stroke resembling a capital I in print; it remained to see how many variations this figure admitted of without danger of mistaking one for the other; and,

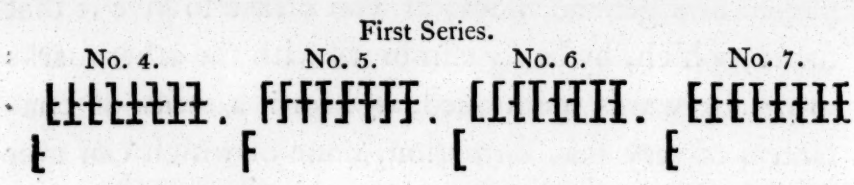
First, the simple right line might be varied by making a short line at right angles to it on the left side, as at No. 1 in the series of primary indexes in the diagram, and this admits of the following distinctions, viz. the left hand mark may be at the bottom of the line, as in No. 2; or at the middle of it, or at the top, as in No. 3 and 4, in the order of succeſsion in the diagram. Second, the left hand mark may be double; and this also admits of a threefold variation, as in No. 5, 6, and 7, in the order of succeſsion; and, lastly, there may be three left hand marks, as in No. 8 of the same. These form in all eight different characters, totally distinct from each other, which might be employed as a general index, if you please to give it that name; which, by being combined with the other marks to be afterwards mentioned, will form a series of characters of very easy formation, none of which can ever be confounded with any of the others, and which would admit of being carried to an indefinite number; much greater than ever could be wanted. These eight characters form what is marked in the diagram under the name of the first primary index, order of succeſsion.

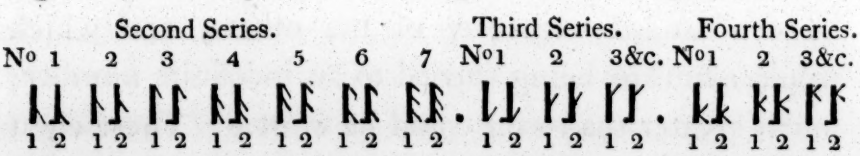
A second variation of the right line may be made with the same facility and certainty as the first, merely by reversing the order of the horizontal mark; that is to say, by putting it to the right hand of the perpendicular line instead of the left; always following the same order in placing the marks as in the first series: that is to say, making the first mark at the bottom, the second at the middle, and the third at the top of the line; then recurring to the double marks, the fourth will be two at the bottom and middle; the fifth at the

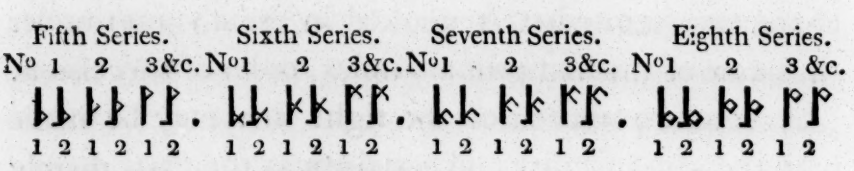
middle and the top; and the sixth at the top and bottom; the seventh has three marks to the right hand; at the bottom, middle, and top. This forms the first secondary index, as marked in the diagram; which consists of seven only, the reason of which will soon appear.

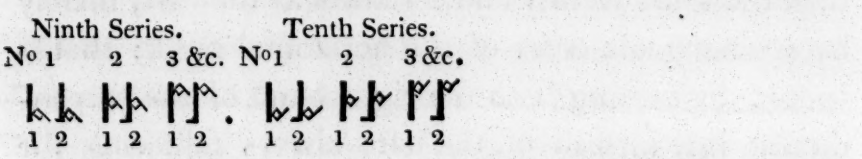












By combining these two indexes together, a third series may be produced of equally easy formation as either, but which are much more numerous. By taking No. 1 of the first index, which is an upright stroke alone, and joining No. 1 of the second series to it, you would form the figure ; but, as it is unneceſ-

sary to make two strokes here, let us suppose them to be combined, and the figure ⌊ would be produced. Continuing then to add the distinctive mark of No. 1 of the first secondary index, and proceeding in order through the whole of the numbers of the first primary index, you would produce No. 1 of the first series, which consists of 8 figures, as the first, because the whole come in their turn to unite with the No. 1 of the first secondary index in succeſsion.

Number 1 of the first secondary index having thus been combined with all those of the first primary index, you once more begin at the beginning of the first primary index, and join with it No. 2 of the first secondary index, which is a mark to the right hand of the *middle* of the line; and, proceeding in succeſsion through the whole of the first index, you form No. 2 of the first series, which is so obvious by inspection that it is unneceſsary to multiply words in describing it.

In like manner you proceed to No. 3 in the first secondary index, which is a mark at the *top* on the right hand side of the line; and, joining it in succeſsion through the whole numbers of the first primary index, as before, you thus form No. 3 of the first series. Numbers 4, 5, 6, and 7, of the first secondary index, when combined in the same manner with those of the first primary index, each set in regular succeſsion after the same order as before, form numbers 4, 5, 6, and 7, of the first series, as in the diagram; in all 56.

It being now no longer practicable to combine No. 1 of the first secondary index with the first primary

index, proceed to No. 2 of the first secondary index, which being an oblique descending stroke to the right hand of the perpendicular, this being joined in succeſsion with each number of the first primary index, as before, forms No. 1, 2, 3, 4, 5, 6, and 7, of the second series, in which I have thought it neceſsary to mark only the two first characters in each number, the other six being easily comprehended by glancing over the first series; so that this also forms 56 more characters.

After the same manner may be applied the secondary indexes No. 3, 4, 5, 6, 7, 8, 9, 10, in succeſsion, which would form in all 560 distinct characters with No. 1 of the first primary index alone.

Proceed, then, to take the second primary index, which is a descending oblique stroke on the left hand side of the perpendicular line, and beginning with No. 1 of the secondary index, and from that to No. 2 and 3, and so on through the whole series, exactly as was done with the first primary index, you will form another series of 560 distinct characters. Then take No. 3 of the primary index, and combine it in like manner, as before, with the whole series of secondary indexes; then go on to No. 4 of the primary index, and so on in regular progreſsion to No. 10, you would thus form 5600 distinct characters, no one of which could in any case be confounded with another. This is much more than can be wanted for any purpose of language; but, were more wanted, it would be easy thus to form ten or a hundred times the number of characters without confusion, merely by varying the form of these

indexes, while you rigidly adhered to the order of arrangement above prescribed.

Please to observe that I do not by any means intend to say that the above is the best mode of forming the characters that could be devised, or to recommend it seriously for adoption as such. It would require a much nicer investigation of the subject than I have bestowed upon it to determine that question. It is only meant to show that the supposed difficulty of forming the diversity of characters that would be required for this mode of writing would be nothing. It might be easily overcome, perhaps, in a thousand other ways. It is also sufficiently obvious that this formation of the characters could be only adapted to printing. For writing, another set of characters, admitting of the same kind of arrangement, might easily be devised; but I do not here enter into that investigation.

I now proceed to state some other difficulties that prefsed themselves upon my mind, and the means of obviating them that readily occurred.

Supposing it were pofsible to invent such a variety of characters as would be wanted, so as that they might be delineated on paper by means of a pen; how would it be pofsible to enable printers to attain a facility in delineating these diversified characters so as to make impreſsions of books? This difficulty I conceived at first would be altogether insurmountable; yet, such of my readers as are in the smallest degree acquainted with the art of printing, who have followed me thus far, will be able to perceive that the difficulty is already removed; and they will have little difficulty

in comprehending that the printing, after this mode of forming the characters, would be indeed more easy than that which they follow at present. Without entering here into minutiæ in regard to this object, it will be sufficient to satisfy them as to this particular, barely to remark that the body of all the characters above described would be formed by one single type only, viz. an upright stroke like a capital I, and that there could be wanted only seven types for forming each of the primary indexes, and an equal number for each of the secondary indexes. This would introduce a simplicity into their busineſs, and a facility in the execution of it that has been hitherto unknown, in regard to which I need not here say any thing more.

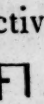
I shall perhaps have more difficulty to satisfy my learned readers of the poſsibility of forming a dictionary of this character that would be of easy reference; yet I make no doubt of convincing them, if they will only bestow the requisite degree of attention to the subject, that this also could be completely and satisfactorily effected without any extraordinary degree of mental exertion. I will, however, confeſs, that when I first turned my attention to this branch of the subject, a chaos of confusion presented itself to my imagination, out of which it seemed next to impoſsible that order could ever arise. The event, however, belied the prepoſseſsion.

It will be easy to perceive that if all the characters were formed after the exact order, and according to the succeſsion above described, and that a dictionary were formed in which the characters were arranged after

the same manner, one series of primary indexes always following another in regular succeſsion, and one series of secondary indexes following according to their regular numbers, with the like precision under each series of primary indexes, it would be impoſsible to devise a more easy mode of reference to each individual character than this would afford. Let it be supposed that I meet with the character  , the meaning of which I do not know. I see at once that it is in the first primary index, and the third Number of secondary indexes. I consult, therefore, the 3d series of the 1st primary index; and I know it must be in the 5th Number of that series, and there I neceſsarily must find it. Every other character you can fix upon would be found with an equal degree of facility and precision; all that is neceſsary to be known, in order to enable the reader to do that, is, that he learn for once the order of the primary index, and that of the succeſsion in the secondary indexes; which could be acquired with half the trouble that the order of succeſsion of the letters of the alphabet can be now obtained.

I do not expect that the reader at the first glance will be able clearly to follow all this; but if he will take the trouble to make himself acquainted with the order of succeſsion in the index mark of the primary index; and then take notice that the same order of succeſsion is invariably observed in the secondary index, and that this order is invariably pursued through each *number* (consisting of eight characters) in each *series*, he will be at length able to perceive that nothing can be more simple and easy than the arrangement here indicated; and that a little practice would render the

use of it as easy as that of the Arabic numerals now in use; though practice alone can ever render this familiar.

In applying these or other symbolic characters to the formation of a comprehensive written language, it might greatly simplify the business were a general form of character to be adopted at all times to denote the noun, adjective, verb, and adverb; one of the sides of which character should always be the straight line, with its modifications which mark its precise meaning. Thus, supposing that the noun were always denoted by a character of this shape  , the adjective of this shape  , the verb of this shape  , and the adverb of this shape  . By this arrangement the leg towards the left hand always admitting of the distinctive marks of meaning, the precise meaning of the word would be always distinctly recognised at the first glance. Thus, supposing the word *love* was denoted by this character  , in that case the noun would be  , the adjective *lovely* would be  , the verb *to love* would be  , and the adverb *lovingly*  , and so on in other cases. I do not mean to state this as a precise rule in practice, because there would require to be several modifications of adjectives and adverbs of particular classes which a skilful grammarian would know how to discriminate. My object here is merely illustrative, so that these niceties must here be overlooked.

There are certain peculiarities affecting each class of words that might be easily expressed by invariable marks of the same kind, that could be added or ab-

stracted from the character, as the circumstances required. For example, every noun admits at least of two numbers, singular and plural. Suppose, then, the character above designed marked the singular, plurality might be at all times designated by a dot placed in the middle between the two legs on a level with their tops; and if a dual plural was wanted, as in the Greek and Ruſsian languages, a double dot would answer that purpose; nor is it impoſsible thus to mark a trial number, should it be wished for, or even a greater number.

Other marks might be adopted to denote gender, which might be inserted in the body of the noun; and this might be made the means of giving a precision to language that it does not at present poſsesſs, unleſs in a few instances. For example, in every claſs of animals there may be at least five distinctions respecting gender, for which, in some cases, we have distinct words in the noun; in others they are wanting; and they are always deficient in pronouns, as we shall soon have occasion to show. The word *cattle*, for example, includes the whole species, male as well as female, with all their subdivisions, however numerous they may be. This may be called the indefinite or universal gender. *Bull* denotes the perfect male, and that alone; this forms the masculine gender. *Cow* denotes the perfect female; and forms the feminine gender. *Ox* denotes the castrated male, and may be called the imperfect masculine, if you please; and a *spayed heifer* denotes a mutilated female, which might constitute the imperfect feminine. To admit of the neceſsary precision, then, every noun or pronoun denoting

animals should admit of all these variations, that might be used whenever the writer found occasion to mark these distinctions, as well as the neuter gender, as we employ it at present for animals whose sex is not known, or not intended to be specified. The indefinite gender might be invariably indicated by the mark of the masculine and feminine conjoined X . The masculine by a distinctive mark placed in the body of the noun, which might be this, with the point downward, thus V ; the imperfect masculine by the same mark, with a stroke through it, thus Ⱶ ; the feminine by a similar mark, with the point upward Λ ; the imperfect feminine by the same mark, with a stroke through it Ⱥ . These, or any other forms that should be preferred to them, when conjoined with the distinctive mark of the name, would convey at all times a precise idea to the reader; and, whether the *spoken* language he used admitted of that distinction or not, he would know the meaning with precision, though he might not be able to expreſs it in words. This is one instance of the neat perspicuity of this mode of writing. Many others would occur in the course of our investigation, were we to prosecute it as far as it might go.

The common accidents accompanying nouns, such as cases, might be also denoted with precision by marks appropriated for that purpose that might be conjoined with the right hand leg of the noun, and which, of course, would denote these cases with precision without altering in any sense the meaning of the original noun. It would be a matter of consideration with the person who was to form this language, whether it would be advantageous to adopt the whole six cases

of the Latin, or only those of the nominative and accusative; which last ought, on no account, to be omitted; as the want of that distinction in our oral language is the cause of much perplexity and inelegance, which ought certainly to be guarded against in this instance.

There would be no difficulty also to contrive a set of marks for denoting the different ages of animals, somewhat equivalent to those of calf, bullock, and so on; only they might be rendered much more definite than ever yet has been done in any language. One mark, for example, might be made to denote those that were very young, newly brought to life, as infant; another might denote the same young when it was capable of doing without the assistance of its mother for food; another for it when it was about mid-age, between birth and puberty; another at puberty; another for middle age in full vigour; and one for senility, or old age. It is obvious that these marks, when conjoined occasionally with any noun whose gender was also expressed, would give a precision and force to the language that never can be done by words. It would be by no means impossible even to denote the precise number of years of age, by Arabic characters inserted within the noun, where that should become necessary for any specific purpose.

The character denoting *verb* would in like manner admit of a series of variations that would denote all the accidents of *persons*, *moods*, and *tenses*, with an equal degree of precision; but it would far exceed the limits to which I must here confine myself to enumerate them all in this place. It would besides be very

foolish even to attempt it, without bestowing a much more serious attention to the subject than this illustrative sketch admits of. By way of beginning, I shall just give a hint of the way in which this might be done with regard to number and persons. The verbal character being of the form already described, might have the person and number thus marked. There are two numbers, every one knows, singular and plural, and three persons in each number. The persons might be thus expreſsed, 1st. person  , a short perpendicular stroke above the left side leg of the character; 2nd. person  , a similar stroke above the middle of the horizontal line at the top; 3d. person  , a similar stroke above the right leg of the figure; and as a dot in general denotes plurality, to denote the 1st. 2nd. and 3d. persons plural, let dots be substituted for the lines, thus,    . This, however, is merely illustrative, and there are perhaps many other ways of doing this that might be more eligible.

There is no claſs of words that are so universally defective in all languages as that of the personal pronouns; and, as there is a neceſsity of having frequent recurrence to these words, this deficiency occasions an embarraſsment and perplexity in the use of language that every person must have experienced. The frequent recurrence of *he* and *him*, *they* and *them*, when signifying different things, has been often remarked. This might be in a great measure obviated by a proper degree of attention in the formation of the new character. The confusion here remarked is in a great measure occasioned by the almost total want of gender in the pronoun of the third person; for as to the single

variation of *he*, *she*, and *it*, with their derivatives, it is so inadequate for the purposes wanted, as to leave us very much embarraſsed respecting this particular. To give some idea of the manner in which this operates, as well as the way in which it might be in some measure improved, I shall subjoin a table of the personal pronouns as they are now expreſsed in the words of our language, accompanied with a set of symbolic characters that might be substituted in their stead. But, as some explanations will be neceſsary to render this intelligible, it shall be reserved for a succeeding Number.

Travels of Viator in Scotland.

Continued from Vol. V. page 475.

VIATOR at length left Edinburgh, intending to go to Perth: but, being desirous of visiting the Carron iron-works, and attending to some other objects that were interesting to him, he deviated from the direct road to go by Linlithgow. On his way to that ancient city, he paſsed a bridge that recalled to his mind the unfortunate Mary, queen of Scotland, and the disastrous events that followed her in an uninterrupted succeſsion from the hour she paſsed this bridge. It was at this place, called then, as it is now denominated, the *New-bridge*, that she was intercepted by Bothwel, on her way from Stirling to Edinburgh, who carried her from thence as his prisoner to his own castle near Dunbar, from which time to her dying hour she may be said to have lived in a state of perpetual confinement, notwithstanding two short starts

of freedom which succeſsively paved the way to greater disasters. Our intelligent traveller speaks of this unfortunate princeſs with a feeling that shows that he is well acquainted with the particulars of her story, and takes a warm interest in every thing that concerns her. He observes a mistake into which Whitaker has fallen respecting this transaction, owing to his ignorance of the local geography of that part of the country. The *Hal-toun*, where Bothwel slept the night previous to this rencountre, Viator says, is evidently the same place that is now called *Hatton*, the late seat of the earl of Lauderdale, which is not more than two miles distant from this place, to the southward. The bridge, which he supposes had been then lately built over a small river, here called *Almon Water*, was pulled down only a few years ago, and a new one of more commodious form erected in its place. He regrets that Whitaker, the avowed champion of this princeſs, should have aſsumed a tone of argumentation so little likely to lead to a dispaſsionate investigation of facts; and he expreſses an earnest wish that some person of adequate abilities would still undertake the task of clearing up this very obscure part of history, which, if done by a person of sound judgment, mild dispositions, and who was warmly attached to the cause of truth, might, he thinks, by the help of facts that have been brought to light within the last fifty years, and others that are still within reach, by a careful search into archives that are now acceſsible, though long shut up from the public, form one of the most interesting morsels of historical composition that has ever been published. He condemns, with a warmth

that is not usual with him, the *abominable performance*, as he calls it, published by Gilbert Stewart, under the title of the history of that princeſs.

In describing the present state of Linlithgow, he remarks the great revolution that has taken place respecting towns in consequence of the introduction of trade and manufactures into the kingdom. Originally, he thinks, towns began to be peopled either on account of the protection the inhabitants derived from the neighbourhood of a fortreſs, or the vicinity of some great man's habitation, which also afforded in the earlier periods of our history protection to the lower orders of the people, or from the vicinity of some religious establishment then held sacred, around which people congregated together in some measure to minister to the wants of the wealthy inhabitants. Hence it has happened, that amenity of aspect has often had a share in the choice. At Linlithgow there was a royal palace, which, though situated on a kind of rock that juts into a beautiful lake of small extent, could not be deemed a place of great strength, though tolerably secure from furtive attacks. It seems to have been chosen on account of the amenity of its situation and the convenience of its position, being nearly midway between the two strong fortreſses of Edinburgh and Stirling, and at no great distance from Dumbarton. It was at former periods a second rate city; but, having no convenience for trade, and few for manufactures of any sort, it is now dwindled into a place of comparative insignificance.

Our traveller, who seems to have bestowed a particular degree of attention to the history of Scotland,

was at pains, when at this place, to inquire for the house from which the regent Murray, the base brother, and insidious adviser of Mary, was shot by Hamilton, of Bothwel haugh. The house was pointed out to him, and is now, as he was told, precisely in the same state it was in at the time of that aſsaſsination; and, from the appearance of the place, he thinks this is highly probable. It forms one of a long-continued row of houses on the north side of the principal street, which is not, he thinks, in that part above thirty feet wide. The window at which Hamilton placed himself was on the first floor; and, as the buildings are low, he must have had as good an opportunity as he could desire of taking an aim, while the regent paſsed slowly in proceſsion on horseback along the middle of the street. A saddled horse was kept in waiting for Mr. Hamilton at the back entry into the yard behind, to which there was no acceſs from the street, but by a very circuitous paſsage; so that he very easily effected his escape after the deed was done. Dr. Robertson, our traveller thinks, must have taken but a very imperfect view of the state of society at this time, when he expreſses his astonishment at aſsaſsinations being then so prevalent, while he states this transaction, and the aſsaſsination of the duke of Guise in France, as proofs of a ferocious spirit prevailing in Europe at that time. Our traveller alledges, that the history of Mr. Hamilton's case should have been sufficient to satisfy any one of the reason why such exceſses should then prevail. Where acts of cruel tyranny can be exercised without fear of punishment from the law, individuals who suffer deeply by these

cruelties will be provoked to attempt to do themselves that justice which the law refuses. This was plainly, he thinks, the situation of Mr. Hamilton. He had espoused the cause of the queen against a rebel (as he deemed Murray to be) who was up in arms against his lawful sovereign. After that rencountre, which ended in her total overthrow, the sanguinary regent pursued his progress, ravaging the lands, and destroying the property, of the unlucky adherents of the queen. Among these Mr. Hamilton, as being one of the principal persons, was peculiarly obnoxious. His property was pillaged; his house burned; his wife, a lovely woman, whose company and conversation were worth to her husband a thousand patrimonies, insulted and abused by Murray, was afterwards turned out of doors naked in a stormy winter's night; under such a complication of distress she lost the use of her reason, and perished in the extreme of misery. Was it strange (says Viator) if a man, feeling the severity of this distress, and conscious at the same time that all hope of legal redress was vain, should be driven to the desperate step that he then took? That it was such sentiments alone, and not a savage brutality of mind, which induced Hamilton to do the deed, was, he thinks, evinced at another period, when the king of France applied to him to assassinate the duke of Guise; a proposition which Mr. Hamilton rejected with horror. "No," said he, "I dare not;—but, if your majesty please, I will fight him fairly in single combat." The prevailing spirit of the times is usually the result of a combination of circumstances, proceed-

ing from the irresistible workings of nature being forced to flow in a particular channel.

Our well-informed traveller could not be so near to Falkirk, and omit to visit, or pafs through it unnoticed. He visited the canal in that vicinity, which he contemplated with enthusiastic veneration. Every inch here is to him clafsic ground. The recollection of past events, contrasted by the present situation of things, suggested to him a train of ideas that led to speculations too extensive for this miscellany. The struggles of the Romans in the plenitude of their power with the undisciplined Caledonians, and the final expulsion of the former from these regions; the patriotic stand which Wallace here made against a powerful invading foe; and the defeat, at a later period, of a well-disciplined army by a rabble, comparatively unarmed, all nearly upon the same spot, confer upon it a character of interest that few others can claim. His reflections, as he pafsed the *Tor-wood*, where Wallace sheltered himself in the body of an old oak-tree, when the jealousy of the nobles circumscribed his career of glory; and along the banks of the Carron, where the short but interesting conversation between that hero and Robert Bruce took place, which was productive of such important events; and the warm eulogium that he bestows upon the unfortunate Wallace ("who, he says, "lived in an age that was unworthy of him,") discover a liberality of mind in the writer that are not common.

He now reached the extensive iron-works erected at Carron about thirty years ago; which, being upon a large scale, and embracing a variety of objects, afforded

full scope to his active mind for the best part of a day. He was so lucky as to see a large cylinder for a steam-engine cast that day; and he describes the proceſs in the manner that may be expected from one who never saw an operation of that sort before; but which, as it would be nothing new to most of our readers, we here omit; as also his account of the *tremendous* bellows, as he styled them, whose stunning roar almost deafened him. Every thing was new to him here. The large hammers for forging bar iron, moved by a stream of water; the facility with which these weighty maſses were managed, and the dexterity of the workmen in this department—in short, the whole proceſs of reducing pig to malleable iron, he considers as a beautiful instance of the influence of mind in extending the power of the corporeal exertions of man. But we wish rather to follow our traveller in his remarks on the local objects that may be said more strictly to peculiarise the country through which he travels, than in regard to the particulars respecting manufactures that are common to many other countries.

"From Edinburgh to Falkirk (says he) the road runs through a champaign country diversified with small inequalities—hills terminating the distant prospect almost every where. On the right hand indeed, for the greatest part of the way, the prospect is circumscribed by a ridge of rising ground, which prevents the Frith of Forth from being seen until you reach Falkirk. This small place is situated upon the brow of an eminence that overlooks a level vale of considerable extent for Scotland, which is bounded on the north by the Forth, and the distant hills of Perth-

shire, which, circling inward to the west, meets about ten miles from hence the rising ground to the south, on which the castle of Stirling stands, and there closes in, forming, as it were, an extensive amphitheatre of great beauty and grandeur. Near the centre of this vale, the Carron-works, from which issues by day an amazing pillar of smoke, and by night immense volumes of fire, is at all times an object of powerful effect. This vale is called the CARSE, a word the derivation of which I do not know, but which I suppose is intended to denote a district that has been gained from the sea; for the whole of this vale consists of a soil that gives strong indications of its being alluvial. The small river of Carron, which winds through it towards its eastern extremity, has been evidently one principal agent in the formation of this plain, which, in its eastern parts, is called the carse of Falkirk, and on its western border the carse of Stirling. The river Carron, when swelled by rains, like all the rivers in mountainous countries, carries along with it a considerable quantity of muddy silt, which, when it met with the rising tide where the river fell into the estuary of the Forth, must have been pushed back towards the west, where, intercepting the mud that, from the same cause, was brought down by the Forth and its tributary streams, must have occasioned a stagnation of the current, during which time the muddy silt must have been copiously deposited along the southern edges of the estuary, at that time an extensive bay. By this means it would be gradually raised above the level of the sea, so as to become in time dry land. To any person who examines the local situation of this part

of the country, and the nature of the soil of this district, I think there can be no doubt but that this is the true origin of the *carse* ground. It is every where a sound firm loam, participating more of the nature of clay than of sand; and its fertility is remarked in this country. Pease, beans, and barley, are here the principal crops; but it seems, in the opinion of skilful farmers with whom I have conversed, more peculiarly calculated for the rearing of wheat than barley: of this, however, I do not pretend to judge. All the crops here appeared to be rich and luxuriant; and the rearing of corn seems to me to be almost the sole employment of the husbandman in this country, whose general industry appears to merit a high degree of commendation. From the Pease-bridge to Falkirk, a distance of more than fifty miles that I have now travelled, I do not recollect that I have seen a single patch of waste ground in that state of abandonment that we call *commons* in England. There is scarcely an inch of land in this tract of the country that has not been cultivated by the plough, unleſs it be the tops of some abrupt and rocky hills: neither have I seen any tracts of *permanent* graſs land. Three or four years is almost the longest time that a field is ever abstracted from the plough in this part of Scotland; neither are their corn-lands in general, I am told, suffered to continue much above that length of time under cultivation. Graſs and corn-lands are thus interchanged into each other throughout the whole country; and, as these *artificial* graſs fields, as they are called (for they are all sown down with seeds) are for the most part made into hay, or applied as green

feed for beasts in the house (being generally cut twice, often thrice in one season) such grafs fields are frequently seen in the midst of corn fields that are not at all inclosed, which gives an appearance to the country that is at least *new* to the Englishman; and which, when seen from the tops of small eminences that frequently occur, gives an open extenſiveneſs to the proſpect that proves extremely exhilarating to the ſpirits of the traveller."

"Viator being now in the midſt of a coal country, reſolved to ſatisfy his curioſity by deſcending into a coal-mine; with which intent he turned a little to the eaſtward toward Bo-neſs [a fine contraction of Bo-riſtown-neſs] which has been long the Scottiſh emporium for ſea coals, as that of Newcaſtle is for England: in going towards which, he paſſed by a place called *Grange-mouth*, which forms the harbour for veſſels entering the Forth and Clyde canal from the eaſtward. This gives riſe to ſome judicious concluding remarks on that canal; which, as well as the former, we here paſs over.

Having provided himſelf with a proper covering to prevent his clothes from ſuſtaining damage in his deſcent into theſe infernal regions, our traveller then proceeded to deſcend, in a bucket ſuſpended by a rope over a windlaſs, to many fathoms deep. "My ſenſations (ſays he) as I deſcended were of a very unpleaſant kind. The dark dank walls of the pit appeared, as long as I had light to remark them, extremely uncomfortable; and the idea that I was ſuſpended at an immenſe diſtance above a cavity by a ſingle line, the ſnapping of which muſt inevitably

hurry me into eternity, made my flesh to creep upon my bones: yet, when I recollected that I had seen a lively little fellow just emerge from this pit before I descended, and jump out of the tub with an unembarrafsed alacrity, as if he had come out of an ordinary apartment, I was convinced that it was nothing but want of practice that made it so horrible to me; and I thus endeavoured, with some effect, to quiet the excefs of my perturbation. It was soon so dark in the pit that I could see none of the objects around me; but the light right above was clearly perceptible. Like an infant viewing a candle, my eye was instinctively turned towards that object, to which it was invariably fixed as I descended. This light, however, was seen perceptibly to diminish in size as I descended, till it had dwindled almost to a point. Watching to mark the progrefs of this diminution until it should become too small to be seen, I had now lost all notion of terror, and sat in patient expectation of the event; when I was unexpectedly, though agreeably, hailed by a gentleman who had politely offered to be my conductor on this excursion, and who had descended before me, who now came forward to receive and welcome me into this subterranean cavity. A candle stood at a little distance, which showed light enough to enable us to distinguish the objects around. He, laughing, took me by the hand, asked how I was, and how I liked my journey; but, without waiting for my answer, he led me forward into a kind of recefs, which had somewhat the appearance of a chamber, that was lighted by two candles which he had brought for the purpose. "This (said my companion) is the ban-

quetting-hall of our infernal palace, where you must taste something before we proceed farther; for, although I cannot treat you in a style befitting the former hospitality of this place, I have provided you something." So saying, he pulled out a pocket bottle of brandy; and, unscrewing the top, which formed a kind of cup, he filled it, and drank to me (for this, it seems, is the etiquette of the place), and then poured out another and gave it to me, which I drank, and found it very refreshing. He then divided a biscuit between us, and we ate cordially together.

"But what do you mean by the former hospitality of this place?" said I. "Why," replied he, "you must know, that elections for members of parliament here, as well as in England, are frequently attended with some make-shift expedients; but we are obliged to conduct matters somewhat differently from you. In elections for boroughs, it is not the pot-wallopers of the place who vote here, but the magistrates only; and, as we do not return two members for a borough which does not contain perhaps an equal number of houses, but four or five boroughs must join in choosing one, it happened that the delegate appointed to vote for Bo-neſs at an election not long ago, the Provost (mayor) of the place was known to be inimical to the person whom the d. of H. wished to be elected; and, as he could not be brought over by any means, some pretext was contrived to induce him to come hither, without the privity of any one, about a week before the day of the election. When he got into this chamber, he was politely accosted by a person appointed for that purpose, who invited him into this

place, which was adorned with some kind of hangings, like a chamber, and neatly fitted up, with tables, chairs, &c. and a small place cut off from it with a good bed in it. Here he also found plenty of victuals and wine, and dainty cates of various sorts, well calculated to make an epicure forget time. "Here, Provost, (said the gentleman) you must be my guest, if you please, till Monday se'nnight; nay, be not surprised (for this was after the election must be over); you need be under no apprehension; for here you shall be treated with the utmost kindnefs and hospitality; you shall want for nothing; but here, positively, you must be my guest till then." The Provost, who was a good jolly fellow, finding that remonstrances were vain, and force unavailing, made a virtue of neceſsity, partook of the good cheer that was so abundantly provided, and the amusements that were contrived to divert him; so that he lived merrily till the time appointed; and some think, that had the day not arrived till now, had he been equally regaled the whole time, he would not have regretted it." We laughed heartily at the joke, took another sip from the bottle, and then proceeded.

"As the seam of coal that has been worked from this cavern was of considerable depth (above six feet) we could here walk about with ease; and, as it has been worked for ages, the excavation is on all sides of immense extent. An expert guide, who knew all the subterranean paſsages well, having been provided, and each of us furnished with a lighted torch, we went forward to a considerable distance before we saw any other appearance of work going forward, than that of

some trucks of a peculiarly simple construction drawn by small horses dragging coals towards the mouth of the pit. These came thither in various directions, some from the right hand (our faces being then, as he told me, towards the west) came, as I was assured, from a very great distance. As the pit was close by the sea-side, which there lay north from the land, I soon recollected that these mines must necessarily be under the bed of the sea. Having expressed this opinion with some degree of surprise, my guide said, that I was perfectly right; that we ourselves were at that very time under the bed of the sea; and that it was very long since the mines had been worked to a great distance underneath the waters; yet the floor on which we walked was perfectly dry. Then, cried I, with some degree of surprise, it is not such a wonderful thing to make a tunnel under the Thames (which is now talked of) as some have supposed; for here is a tunnel of the same kind, and of much greater extent. True, said he; but you will recollect that there is, over our heads every way, a bed of solid clay perfectly impervious to water, that is at least thirty fathoms in thickness; and I doubt much whether you will find such an impervious bed under the Thames; besides, were it so, you must raise and lower your waggons, horses, and all that are to go through the tunnel, by means of tubs and ropes, as you was let down; for it would be impracticable to descend to such a depth, and re-mount to such a height, after any other manner. I smiled at the idea of letting down the waggons in a tub, and we proceeded in our career.

"After walking, perhaps, a quarter of an hour through

a paſsage open on every side, the roof of which was supported by pillars of coal left for that purpose, we at last came to the place where the miners were working. These were proceeding in their task with great alacrity; some singing, the sound of whose voices was frequently interrupted by the crash of large lumps of coal thrown down from their places by the operations of the miners; while the tinkling of pickaxes on all sides, and other noises, made a confused din that scarcely bore resemblance to any thing that I had ever heard. Some miners, whose task was ended, were reposing themselves, most of whom rose up from respect for us, and offered every aſsistance that was in their power; but none of them offered to beg, or seemed to look for any gratuity. They were a black-looking rugged set of men, but strong, and seemingly healthy and contented.

"The coal here does not come out of the mine in small pieces like the Newcastle coal, but in large lumps like stones, which they carry out in as large pieces as they can conveniently manage; for, the larger the pieces are, the higher price they bring at market. The small knobs sell at an inferior price, and those pieces that are about the size of Newcastle coal are accounted as of no value, for they do not run together, or cake, when heated. They are sometimes employed for the purpose of burning lime, or bricks, or making salt; but in many places they are applied to no use whatever, but are suffered to go entirely to waste. These are excellent coals, making a clear brisk-burning fire that gives a great heat; but they are soon consumed. Those coals that are near the sea sell at a high price,

because of the good market at a small expence of carriage; while those at a distance within land afford the proprietor very little. I was told that the Carron company rent a great many coal mines about Falkirk, for which they allow the proprietor six-pence a ton only for all that they work; they themselves being at the expence of mining.

"My curiosity being soon satisfied here, I gave the men, in return for the civilities they had showed us, a few shillings among them, which with some difficulty they were prevailed on to accept. We retraced our steps, and, having gained the bottom of the shaft, stepped into the tub or bucket, and were hauled up by a process the reverse of that by which we descended. We regained the day without having met with any accident, or having suffered any inconvenience."

To the Editor of Recreations in Agriculture, &c.

SIR,

THOUGH I am not in the practice of writing to learned men, I am emboldened, from the character given of you by a nephew of mine who takes in your publication called *Recreations*, to take this method of requesting your animadversions on a practice lately introduced into this country, which threatens to prove destructive to many individuals, if it be not soon corrected: it is that of raising the roads so high in the middle, and sinking them so deep in the edges, as to render it extremely dangerous for carriages to pass along them. I myself, sir, have been

long in a poor state of health; and the best remedy I have discovered is that of making a short excursion into the country occasionally, in a carriage, in the morning of a fine day, and returning in the evening; which I have been accustomed to do in a stage coach, as the cheapest mode of conveyance that I can obtain.

But of late I find that, on many occasions, the coach leans so much to one side, as to give just alarm to the paſsengers lest it should overturn; and, although I am not very timid, I am so sensible of the real danger (because I know that the slightest touch on such occasions would make it go over), that I cannot help feeling a kind of terror which I never used to experience; and, at the same time that I perceive the risk of being overturned, I cannot be blind to the danger that must be incurred in case of that accident happening; for, in most cases, the carriage would either be dashed against the sharp stone pavement raised at the edge; or upon houses, which must occasion a much severer shock than if it were to fall into a bed of mud. What the reason for this innovation is, I cannot tell; perhaps you may be able to do so; but, in my opinion, the benefits to be derived from it should be very great to counterbalance the evils which evidently result from it. If you will be so kind as to make such observations as occur to you on this subject, you will do a kindneſs to many, and confer a particular favour on MARTHA MEANWELL.

I too had remarked the evil of which this good lady complains, and have felt the inconvenience resulting

from it on many occasions; for all ladies who travel in a coach are not so moderate in cases of apparent danger as seems to be the case with Mrs. Meanwell. To be serious, however, it really appears astonishing to me, that men who have the management of roads, and who should at least be at some pains to make themselves acquainted with the true principles on which these ought to be constructed, should be so inattentive as to run into the excefs of which my correspondent so justly complains. Persons who have not been acquainted with that department of businefs, I should by no means be surprised to see fall into that error; for, as the most obvious inconvenience to which roads in this neighbourhood are subjected, is that of mud and wet, it is by no means unnatural for them to think, that the more nearly a road can be brought to resemble the roof of a house, the more effectually will it throw off the water from it; and that, therefore, the higher it can be raised in the middle, the better it must be. But, afsuredly, the experience of a very few months ought to satisfy every thinking person, that a form of this sort can in no case be ever proper for a road. Were the materials of which it is constructed so hard as to be even impervious to water (like the tiles on the roof of a house), it could not be kept in repair for any length of time; for all weighty carriages must in this case choose the middle track only to go upon; and there it must be inevitably cut up into ruts, in spite of every effort to prevent it; and when even lighter carriages are neceſsitated to go from the middle upon one side of the road, there is such a proportion of the load thrown upon the lower wheel, as to make

it cut nearly as deep as one of double its weight would do, were the preſsure on the wheels of both sides nearly alike. Nothing, therefore, can be so injudicious as this construction of a road in any case; but where the materials are soft, as is the case every where in the neighbourhood of London, it becomes doubly injudicious, and must enhance, to an astonishing degree, the expence of keeping the roads in repair. All these consequences are obvious to a thinking mind, even independent of the consideration of the risk that carriages run of being overturned upon a road of this form, and the consequent danger of many lives being lost or limbs broken by accidents of that kind, in the jostling that must inevitably occur in the crowded avenues that lead to this metropolis.

The only object that can be apparently obtained by raising the middle of the road to such a disproportionate height is, to throw the water that falls upon the road itself into the ditches; and, were the road at all times smooth and firm, this would doubtleſs be effected; but, were it smooth and firm, the same object would be attained were it raised but a very little above the edges. All that would be required in that case would be, to keep the water-courses at the edges clear, and to provide a ready outlet there for the water to flow off; so that, in that particular case, the elevation, which is evidently so incommodious and dangerous, would be unneceſsary; seeing that the water-courses might be kept clear at perhaps one tenth part of the expence that will be required to make and keep in repair the road upon the high-crowned construction.

But if this form of road be unneceſsary where the

materials are firm, it becomes ten times more so where the materials are soft. The water, in that case, which falls upon the middle of the road, cannot flow along the *surface* till it reaches the gutter. It sinks into the soft materials, where it is mixed by the wheels into mud, that, by the continual working of these, becomes nearly as soft as water. It never comes, however, into such a fluid state as to run off; for, as it descends toward the sides, it becomes thicker and leſs fluid, in consequence of the slighter degree of commixtion which it there sustains, while that in the middle is worked down by the wheels deep and deeper, as long as the moist weather continues; so that the only effect thus produced is, to render the mud unequally thick upon the road, and of different degrees of tenacity; that on the middle being only a thin gruel, while toward the sides it is deep and gluey, so as greatly to augment the difficulty of moving the carriages; whereas, had the road been more level, it would have been of nearly an equal degree of fluidity, depth, and tenacity, over the whole; and would, of course, be more quickly rendered firm on the return of dry weather, than it can be on the sides of the high-raised road. Under every point of view, then, the practice of raising roads to this extravagant height in the middle is injudicious, uneconomical, incommodious, and dangerous; and, being productive of no one advantage that can counterbalance these evils, it cannot surely be too soon abandoned. I consider it even as a national disgrace to be tolerated; as it must proclaim our folly to every foreigner who paſses along our roads to remark upon them. On this account, and

for other reasons of a similar sort, I think it would be a good thing if a law were obtained ordering the name or names of the persons who have the charge of making the roads in every district to be posted up at each turnpike-gate, as that of the toll-gatherer is at present; in order that the obloquy which is thus incurred may fall upon none but those who, in justice, ought to bear it.

Extracts from the Ayeen Akbery.

INSTRUCTIONS FOR THE OFFICERS.

[*Continued from page* 71.]

The Amilguzzar (or Collector of the Revenues).

He must consider himself the immediate friend of the husbandman, be diligent in business, and a strict observer of truth, being the representative of the chief magistrate. He must transact his business in a place where every one may find easy access, without requiring any mediator. The crafty and disobedient he shall strive to reform by reprehension; and if that produce not the desired effect, he shall inflict other punishment. Let him not be discouraged at the lands having fallen waste, but exert himself to bring them back again into cultivation. He shall not be satisfied with receiving pecuniary fines in exculpation for murders and other capital offences: his conduct must be such as to give no cause for complaint. He must assist the needy husbandman with loans of money, and receive payment at distant and convenient periods. When any village is cultivated to the highest degree

of perfection by the skilful management of the chief thereof, there shall be bestowed upon him half a biswah out of every beegah of land, or some other reward proportionate to his merit. Let him endeavour to ascertain the quantity of land in cultivation, and make trial of different portions, in order to gain a competent knowledge of its various properties, for there is a great difference in the value of land; and some soils are only capable of being cultivated for particular purposes. Let him learn the character of every husbandman, and be the immediate protector of that class of our subjects. He shall acquaint himself with and maturely consider the conduct of former Aumils; and if they appear to have been guilty of inconsiderateneſs or dishonesty towards the husbandman, he must strive to remedy the evils they may have occasioned. Let him endeavour to bring the waste lands into cultivation, and be careful that the arable lands are not neglected. Let him promote the cultivation of such articles as will produce general profit and utility, with a view to which he may allow some remission from the general rate of collection. If an husbandman cultivate a leſs quantity of land than he engaged for, but produces a good excuse for so doing, let it be accepted. If an husbandman is able to cultivate more bunjer land than may happen to be in his own peculiar village, he shall be allowed land in some other place. Let him use the utmost circumspection and impartiality in measuring the lands. He shall annually assist the husbandman with loans of money. Let him see that his demands do not exceed his agreements. If in the same place some want to engage by

measurement, and others desire to pay their proportion of the revenues from an estimate of the crops, such contrary proposals shall not be accepted. As soon as the agreements are concluded and executed, let them be sent to the presence. Let him not be covetous of receiving money only, but likewise take grain. The manner of receiving grain is after four ways:—First, *Kunkoot*. *Kun*, in the Hindovee language, signifies grain; and the meaning of *Koot* is conjecture or estimate. The way is this: The land is measured with the crops standing, and which are estimated by inspection. Those who are conversant in the business say that the calculation can be made with the greatest exactness. If any doubt arise, they weigh the produce of a given quantity of land, consisting of equal proportions of good, middling, and bad, and form a comparative estimate therefrom. Second *Buttiey*, and which is also called *Bhaweley*, is after the following manner: They reap the harvest, and, collecting the grain into barns, there divide it according to agreement. But both these methods are liable to imposition, if the crops are not carefully watched. Thirdly, *Kheyt Buttiey*, when they divide the field as soon as it is sown. Fourth, *Lang Buttiey*. They form the grain into heaps, of which they make a division. Whenever it will not be oppressive to the subject, let the value of the grain be taken in ready money at the market-price.

If an husbandman sows his land with the best kinds of grain, let there be remitted the first year a fourth part of the rate for poolej land. If upon making the measurement the kinds of grain appear to be better,

although the quantity of land be less than was agreed for, so that the difference causes no deficiency in the revenues, the aumil shall not express any displeasure thereat; and in every instance he must endeavour to act to the satisfaction of the husbandman. Let him not entrust the principal men of the village with making the estimates of kunkoot; for such a measure, by giving room for oppression, would create disgust, and consequently occasion indolence and neglect. But, on the contrary, let him transact his business with each husbandman separately; and see that the revenues are demanded and received with affability and complacency. He must take securities for the conduct of the land-measurers, weighmen, and other officers in this department.

Extra Daily Allowance whilst employed in making the Measurements.

Officers.	Flour. Seer.	Oil. Seer.	Rice. Seer.	For Pot-herbs. Dams.
Tepukchy	5	½	7	4
Measurer of land	4	½	¼	4
Four tannahdars	8	1	—	5

And besides the above, he shall pay them their monthly salaries. They shall fix a mark upon the land they have measured.

The aumil shall take a written obligation from the principal inhabitants, to discover any difference that may happen in the crops. If at the time of making the measurement he meets with a parcel of bad land, he shall immediately make an estimate of the quantity and quality, and give the paper to the husbandman, by way of certificate. If such discovery be made after

gathering the harvest, he shall collect information from the neighbours of that place, as well as from the putwaree's accounts, and allow what may appear to be the medium.

The mohurur and the putwary shall keep their respective accounts of the produce of the soil, in the same manner as the karkun. When the aumil has compared these accounts together, he shall put his seal to them, and give the karkun, mohurur, and putwary, copies of their respective papers. When the accounts of the crops of a village are completed, they shall be subjoined to the montijee (or account of afsets) and again authenticated by the karkun and putwary. This paper ought to be sent to the presence weekly, and must on no account be delayed beyond a fortnight. If after sending the nesukh (estimate of afsets of revenue) any calamity befalls the crops, the aumil shall immediately investigate the circumstances, make an exact calculation of the lofs, and transmit the same to the presence, in order that it may either be approved of, or an aumeen sent to make further inquiry. Let him collect the revenues with kindnefs, and never make any demands before they become due. He shall commence the collections of the spring harvest from the Hooly. This is an Hindoo festival which falls out differently between the time of the sun's arriving at the end of Aquarius to the fifteenth of Pisces. The autumn harvest he shall begin to collect from the Defshereh, which is another Hindoo festival that also happens differently, from the beginning of Virgo to the commencement of Libra. Let him be careful that the treasurers do not require any

particular species of coin, but that whenever there be any deficiency in fineneſs or weight, the exact deficiency be taken, and an account thereof given in writing. Let him agree with the husbandman to bring his rents himself at stated periods, that there may be no plea for employing intermediate mercenaries. Whenever there is a plentiful harvest, let him collect the full amount of revenue, and not leave any balances to be realised from future crops. If any one does not cultivate kherajeeland, but keeps it for pasturage, let there be taken yearly from a buffalo six dams, and from an ox three dams; but calves should be permitted to graze without paying any duty. For every plough there shall be allowed four oxen, two cows, and one buffalo; from whom likewise no duty shall be taken for pasturage.

He shall himself keep an exact account of whatever is paid into the treasury; and having compared it with the journal of the karkun, cause it to be authenticated by the treasurer. Having fastened and sealed up the money-bags, let them be deposited in a safe place, on the door of which there shall be several locks of different constructions; he shall keep one of the keys himself, and the others are to be in the charge of the officers of the treasury. At the end of every month he shall take from the tepukchy an account of receipts and disbursements, and send it to the presence. Whenever two lacks of dams are collected together, they are to be sent to the principal treasury, under charge of a trusty person. Let him give directions to the putwary of every village, that whenever there be any balance in favour of the subject, he be furnished with a

memorandum specifying the particulars thereof; and he shall also be directed to draw out an exact account of the balances due to government, with the names of the persons indebted, which shall be signed by the principal part of them. Let the balances be collected without oppreſsion from the next harvest. He thall attentively examine the grants of seyurghal, and, taking copies thereof, send them to the registry to be compared. Let him carefully scrutinise the chucknameh, and resume the share of the defunct, the absentee, and those who are removed from offices. Let him be cautious that resumed lands are not suffered to remain uncultivated. He shall mind to take proper care of the effects of absentees, and of those who die without heirs, and represent the circumstances to the presence. Let him see that no jezeyeh be collected, and that whatever taxes former monarchs thought proper to remit, do continue to be excused. The charges attending travelling, feasting, or mourning, shall not furnish pretences for exactions; neither is he permitted to receive salamees of any kind. The mokuddem and putwary, whenever they came with treasure or to the courts of justice, used to present a salamy of a dam each; which custom is ordered to be discontinued. Also bilkutty, meer behry, rahdary, duties upon blankets, wool, leather, and ghee, and various other vexatious taxes, which the avarice of men who feared not God had introduced, to the oppreſsion of mankind, he shall by no means suffer to be exacted. He shall appoint one who is perfectly acquainted with the districts under his charge to reside at the presence, for giving the most minute informa-

tion that may be required. He shall make a monthly report to the presence of the condition of the subjects, jageerdars, neighbours, and rebels, together with the market-prices of goods, the rent of houses and shops, the state of dervishes and artificers, and every other remarkable occurrence.

If there be not any cootwal within his district, the aumil shall execute that office in the manner prescribed by the regulations for that department.

The Tepukchy (or Superintendent of Police)

Must be of an upright disposition, a good writer, skilful in accounts, and industrious, as the aumil depends solely upon him for just information. His duty is this: he shall take from the canoongoo an account of the medium state of the revenues for ten years in money and in kind; and, having thereby made himself acquainted with the nature and capacity of the country, satisfy the aumil in every particular. He shall write down whatever engagements are made with the husbandman. He shall keep a separate account of the boundaries of the villages. He shall draw out a statement of the waste and arable lands, to which he shall subjoin the names of the munsif, the measurer, and tanahdar, together with those of the husbandmen and niyaks (or chiefs of the village) the articles of cultivation, villages, pergunnah, and harvest; and subtracting the deficiency, leave the amount of aſsets. When the measurement of a village is completed, let him draw out the proportion of aſseſsment of each husbandman, and specify the revenue to be paid by that place, to serve as a rule for the aumil's

collections. The account of measurement, which, in the Hindovee language, is called *khessereh*, shall be sent to the presence. At the time of drawing out the towjee (or account of demands) if former statements thereof are not procurable, let him obtain information, by taking from the putwary an account of the land cultivated by each husbandman. The towjee, together with the accounts of receipts and disbursements, shall be sent to the presence regularly. The name of the collector shall be written in the journal at the bottom of the account of each place. When an husbandman brings his revenue, let him have a receipt for it, signed by the treasurer. He shall receive from the putwary and mokeddem copies of their towjee accounts, as a guidance for making the collections, together with copies of the firkhut, or receipts, which are given to the husbandmen. These he shall carefully compare together, and if he discovers any fraud or collusion, inflict a fine upon the offenders. He shall daily report to the aumil the receipts and balances of every village, and stimulate him to the performance of his duty. Whenever a husbandman comes to settle his account, let it be done immediately. At the end of every harvest, he shall prepare accounts of receipts and balances, and compare them with the putwaree's books. He shall keep a journal of receipts and disbursements under every name and form, and which shall be every day authenticated by the seals and signatures of the aumil and treasurer. At the end of the month he shall inclose the above account in a khereeteh (or silken bag) under the seal of the aumil, and send it to the presence; whither he shall also daily transmit,

under the seals of the principal officers, the rates of exchange of mohurs and rupees, together with the market-prices of every article. At the end of every harvest, he shall draw out a particular account of the treasurer's receipts and disbursements, and send it to him for his signature: and at the end of the year let there be sent to the presence, under the seal of the aumil, the mujemmel (or abstract) and the jummabundy (or particular account of aſseſsment). If any place has been attacked and plundered, let a calculation be made of the loſs sustained in cattle and effects, which is to be entered in the journal, and the circumstances represented to the presence. When the season for making the collections is concluded, he shall draw out an account of what remains due from the country, which he shall deliver to the aumil, and send a copy to the presence. In case of dismiſsion from office, he shall deliver over to the new aumil an account of the balances of revenue and tekavy; and, after having satisfied him regarding those particulars, take an abstract thereof, and repair to the presence.

The Treasurer.

The treasury shall be situated near the residence of the principal officer of government. The treasurer shall not demand from the husbandman any particular kind of coin, but receive mohurs, rupees, and copper of every species. No serf shall be taken upon the coins of the present reign that are of full weight; and if any of them are short in weight, the deficiency only is to be made up. The coins of former reigns shall be received as bullion. The money shall be carefully kept,

with the knowledge of the shekdar and karkun; it shall be counted every evening, and a memorandum thereof signed by the aumil. His accounts are to correspond with those of the karkun, who is to countersign them. He is to have one of the keys of the treasury; and whenever it is to be opened, he shall apprize the aumil and karkun thereof. He shall not receive any money without the knowledge of the aumil and karkun; and he shall give the husbandman receipts for his payments. To the book, which in the Hindovee language is called Bihee, the putwary shall affix his signature, in order that there may not be any disagreement in their accounts. No disbursements shall be made without the approbation of the dewan, excepting in cases of absolute neceſsity, which will not admit of delay, when he may act from the orders of the skedhar and karkun, but must afterwards represent the case to his superiors.

On the diversities of plants, respecting size, durability, and other circumstances.

THE diversities of nature are infinite. In the vegetable kingdom, some plants require a long succeſsion of ages to bring them to perfection, while others attain their full maturity in a few hours: some are of immense magnitude, while others of inferior stature descend by a gradation, the termination of which cannot be perceived by us, because they are too minute to be cognisable by our senses, even with those aids that human ingenuity hath devised for extending their power beyond its natural limits. When we contem-

plate these extremes, the imperfection of the boasted power of man becomes conspicuous; and when we survey the intermediate gradations, such an endleſs diversity of objects present themselves, calculated to augment the comforts of life, that the boundleſs beneficence of the author of all existence becomes eminently conspicuous.

These reflections naturally suggested themselves on reading the account of a tree that grows in the western coasts of Africa, as described by Adanson in his account of those regions, by him called baobob, though by some others, the calabash tree (a very different tree from the calabash tree of America), which, for longevity and magnitude of size, far exceeds any other claſs of plants that has yet been discovered. The usual size of the stem of one of these trees is 75 feet in circumference, or 25 feet in diameter. This tree is of slow growth, when compared with most others in those regions; so that there is reason to believe it may subsist in a growing state for many thousands of years. When this is contrasted with the mushroom, which it so nearly resembles in form, and which springs up in a day, perfects its seeds, and is withered to-morrow, the difference between them appears to be immense, both in point of magnitude and duration; but when we carry our views still farther, into that immense profound of minuteneſs which has but of late been partly laid open to us by the invention of the microscope; into the claſs of moſses, which are in some measure cognisable by the naked eye, and still farther into the more minute claſs of plants denominated *mould*, which, even in those of the largest

species, are too small to have their parts cognisable by the naked eye, and which, when viewed by the best microscopes, discover a series of existences diminishing by a regular gradation, like stars in the galaxy under the best telescopes, till they are lost in the infinity of minuteneſs, leaving every reason to believe, that, could the magnifying powers of our instruments be augmented a thousand-fold, we should still find ourselves as far from discovering the termination of this series of infinite diminution as we were at the commencement of our imperfect survey. The world that we see, therefore, seems to be but a very small part of that which exists: our feeble optics are capable of taking in scarcely a point of that universe which surrounds us; and our imperfect understandings can scarcely obtain a glimpse of that infinite power and wisdom which regulates the whole. Among this infinity of objects, however, we can clearly perceive the most perfect regularity and order pervading every part; and that all the operations of nature proceed with invariable steadineſs to effect the purposes for which they have been designed.

Thus we see that all animate objects, from the largest that has been discovered on this globe, to the smallest that can ever be made to be perceptible to us, invariably proceed from other animated objects of the same kind, although they appear at times under such disguised forms as not to be at first sight cognisable by us. This rule applies to vegetables as well as animals. The plant of *mould*, which, even when it hath attained its full stature, can scarcely be perceived as a point under our microscopes of the highest magnifying power, we have every reason to be satisfied, produces

its seeds in as regular order, which ripen at their appointed period with the same regularity as those of the mighty baobob: but while this remains a stately monument upon the surface of this earth, and sees thousands of generations of men succeed each other, and succeſsively shelter themselves under the protecting shade of its spreading branches, we observe the *mould* spring up, perfect its seeds, scatter them in imperceptible myriads in the air, and disappear within the short space of *one hour*; so that during the short period of our existence here many myriads of generations of mould have succeeded each other. *Time* itself then, when the universe is viewed as a whole, can only be considered as a relative object. Shall man then, a being who cannot comprehend fully the nature of a single object around him, dare proudly to lift up his face, and pretend to decide concerning poſsibilities and the powers of nature! His proper province is to be humble and adore!

The plants with which we are best acquainted may be arranged into three grand divisions. The *first* are those whose roots and stems remain for many years, which comprehends all the varieties of trees and shrubs. These, for the most part, require several years to bring them to a state of puberty (if that phrase may be admitted), when they begin to put forth flowers, and perfect their seeds; after which time they usually continue to produce an annual crop of flowers and seeds for a long period of time; the fruit in general succeeding the flowers, and perfecting their seeds in the same year: but to this rule there are several exceptions. In a few instances the seeds do not attain to maturity in the same season that the flower is produced; but, con-

tinuing upon the tree the whole winter in an immature state without being killed, they advance in the second season, and then only perfect their seeds; instances of which are to be found in the juniper and orange-tree. Others continue to advance for several years, as usual, without showing fruits; and when at length they reach that state of maturity, they then flower, and, having perfected their seeds, they decay and flower no more, dying down like annual plants; an example of which is to be found in the cabbage-tree of tropical regions. Some are scarcely ever (perhaps never) known to produce either flowers or seeds of any sort, but admit of being propagated by some other means; instances of which are to be found in the English elm of our own country, the Jack, or bread-fruit tree of India; and many others.

The *second* division of plants are those that have a perennial root, from which stalks are sent forth annually, which usually produce flowers, perfect their seeds in the summer, and die down to the ground at the approach of winter. The stems of these are for the most part of a similar structure and consistence with those of

The *third* clafs, or annuals, from the seeds of which, if sown in the spring, stalks spring up which produce flowers and seeds the same season; after the perfecting of which the stalks decay and die entirely away. Biennials can only be viewed as a diversity of these that have not sufficient length of season to bring them to perfection in one year.

Whether distinctions similar to these take place among those minute tribes of plants which we call

microscopical, it exceeds our power at present to determine. From the short period of their existence, we have been generally inclined to think that they are all similar in quality to annuals; that is to say, that they flower but once, and die down immediately after they have once perfected their seeds. Yet, who dares pretend to say, that the plant of *mould*, which exists perhaps but one of our hours, may not produce in that period many thousands of succeſsions of ripe seeds, each of which has taken its due season to ripen like those of the baobob, which flourishes on our globe for hundreds of ages! for the same infinite power which has decreed that the total duration of this plant shall be limited to an hour, may have also decreed, that the maturation of its seeds, and the completion of a period that to *it* should be similar to that of our year, should be accomplished in the thousandth part of a second of our time.

Having premised these general observations, I shall now present my readers with an abstract of Mr. Adanson's account of this singular tree.

Of all the trees, he says, hitherto unknown among us, that have been found at Senegal, the baobob is the most remarkable, for its enormous bulk, which gives it rather the appearance of a forest than a single tree, when it is seen at a distance. Its trunk, which is seldom more than ten or twelve feet high, is no leſs than 75 or 78 feet in circumference, which, at a medium, gives a diameter of eight yards and a half.

This trunk is crowned with a great number of spreading branches remarkable for their thickneſs, and yet more for their length, which is in general from 50 to 60 feet. The centre branch rises perpendicularly;

but none of the rest make more than an angle of thirty degrees with the stem, the greater part stretching out horizontally; so that the ends frequently bend down till they touch the ground; and the whole, at a distance, has the appearance of a hemisphere from 60 to 70 feet high, and about 140 feet in diameter; or of an enormous mushroom.

To these branches above, there is a correspondent number of radical branches below. The top root extends downward to a great depth, and the others spread nearly in a horizontal direction, sometimes to the distance of a hundred and forty feet.

The bark is nearly an inch thick, of an ash-coloured grey, greasy to the touch, bright, and very smooth; the outside is covered with a kind of varnish, and the inside is green, speckled with red. The wood is white, and very soft; the first shoots of the year are green and downy, somewhat like the *sumach*, or *stag's-horn*.

The leaves are oval, pointed at the end, about five inches long, and two and a half thick; they are proportionally thick, smooth, and without indentures at the edge. From three to seven, but generally seven of these leaves, are attached to one pedicle (like the horse chestnut) those that are farthest from the branch being always the largest.

He describes the flowers as being very large and white. The fruit, which hangs pendent by a long foot-stalk, is, he says, of an oval shape, pointed at each end, about ten inches long, and six inches wide. From this general resemblance of the fruit to that of the calabash, it has obtained sometimes the name of

calabash tree. This fruit is covered with a kind of bark, which is woody, and very hard. It is about a third of an inch thick, and covered with a green down; when the down is removed, it appears blackish, and slightly marked with ten or fourteen grooves which reach its whole length.

The fruit never opens of itself; but when it is cut acroſs it discovers from ten to fourteen partitions, consisting of a reddish membrane, which form so many cells that are filled with seeds.

The seeds, however, are not discovered at the first opening of the fruit; being enveloped in a spongy substance of a whitish colour. The seeds are shaped like a kidney-bean, of a blackish brown colour, and very smooth and bright; they are about half an inch long, and somewhat leſs than a third of an inch wide.

The tree sheds its leaves in November, and new ones appear in June. It flowers in July, and the fruit ripens in October and November.

It delights in a sandy, light, and moist soil. Its roots are apt to rot when it meets with any hard stratum beneath, and the tree then perishes. It is very common in the Cape de Verd islands; but is found 100 leagues up the country at Gulam, and upon the sea coast as far as Sierra Leone. It is best propagated by seeds: the plants to be put in their place when from six months to two years old.

This tree is subject to a kind of mouldineſs, which spreads through all the woody part, and reduces it to the consistence of a kind of pith, without making any alteration in its colour or the disposition of its branches. In this state it is incapable of supporting itself against

the wind, and is then generally broken off near the middle by the first hard gale.

If it neither rots at the roots, nor grows mouldy in the stem, it lives very long: a fact which, in a country where no records of past events are preserved, it seems rather difficult to ascertain; yet, from some circumstances that have accidentally occurred, this may be done with a tolerable degree of certainty, and its longevity ascertained with some precision. Mr. Adanson relates, in his "Voyage to Senegal," that there are two of these trees in one of the Magellan islands inscribed with the names of several Europeans, and very distinctly dated in the 15th and 16th centuries: there are also on the same trees dates of the 14th century; but they are almost obliterated by time. These are, probably, he thinks, the same trees mentioned by Thevenot in his account of a voyage to the Terra Antarctica in 1555. The letters of these names were scarcely six inches high, and the names themselves took up scarcely two feet in length, which is not more than a ninth of the present circumference of the tree: however, setting aside the date of the 14th century, and supposing the trees which are now 18 feet round to have been but two feet round in the 15th century, it is clear, that if in two centuries they gained 16 feet in circumference, which is five feet one third in diameter, they will not gain a diameter of 25 feet (their usual dimensions) in lefs than eight centuries.

From the fact above stated, this seems to be the largest *possible* augmentation of size that could have taken place in two centuries. But if it be accurately investigated it will appear, that its progrefs must have been greatly

slower than is here stated; for it runs upon the supposition, that the original inscription went round the whole girt of the tree; but if the inscription had gone wholly round the tree, it must have still surrounded the whole girt of the tree also; for the letters must expand in width in proportion as the tree advances in size. It could, therefore, have originally occupied no more than one ninth part of the circumference of the tree, as it does now; on the supposition, then, that the letters occupied originally one foot in length, the tree must have been then fully nine feet in circumference. In two centuries, then, they would have gained only nine feet in circumference, or three feet in diameter, according to which progreſsion they could not attain a diameter of 25 feet in leſs than seventeen centuries. If the length of the name were supposed to have been more than one foot originally, it would give a still slower progreſsion.

Again: it is well known, that trees in general increase much faster when young, than when they approach nearer to their full magnitude; and that, after they attain their full stature, they remain very long without making any perceptible advances. How many old oak-trees have been known to stand for centuries without the smallest perceptible advance in size! The tree now in question seems to have been during these two centuries in the most vigorous period of its growth; so that, taking this particular into consideration, it would indicate an age, not of 18 centuries only, but perhaps of four times that number, before it might be supposed to attain the vast diameter of 28 feet.

The baobob seems to be no exception from the ge-

neral rule that applies to the growth of other trees. A tree of this kind, Mr. Adanson observes, is known to arrive at the height of five feet, and to be from an inch to an inch and a half diameter the first year; which, at the end of ten years, is 15 feet high, and one foot in diameter (a progreſs very slow when compared with that of most of the trees in those regions); and at the end of twenty years about one foot and a half in diameter, and twenty feet high. Such was the increase of trees which *Mr. David*, the French governor of Senegal, planted in that island in the year 1736; and it is neceſsary to remark here, that the soil is sandy, moist, and exactly such as the baobob tree most delights in; and, though the progreſsion is not to be wholly relied upon, yet it may give sufficient grounds to conclude, that the growth of this tree, which is very slow, when its enormous size is considered, must continue many thousand years; and, perhaps, reach as far back as the deluge; so that, upon the whole, the calabash tree, or baobob, may be considered as the most ancient living monument on the earth; it is at the same time, without doubt, the largest vegetable production in nature.

Neither the magnitude nor the longevity of this tree, however, are the circumstances that chiefly recommend it to the notice of the natives of those barbarous nations, though its thick shade must afford them a most refreshing shelter from the scorching heat of the sun in those sultry regions. The bark and the leaves of this tree being of a mucilaginous nature, they employ them for culinary purposes. They first dry them in the shaded air, and then reduce them to

powder, which is of a pretty green colour; this powder they preserve in bags, and call it *lillo*; they use it every day, putting two or three pinches of it into a mefs, whatever it happens to be, as we do pepper or salt. Their view, however, is not only to give a relish to their food, but also to preserve a perpetual and plentiful perspiration, and to attemper the too great heat of the blood: purposes which, Mr. Adanson observes, it certainly answers, as several Europeans, he says, have proved by repeated experiments, and thus preserved themselves from the epidemic fever which in that country destroys Europeans like the plague, and generally rages during the months of September and October, when, the rains having suddenly ceased, the sun exhales the water which they leave upon the ground, and fills the air with a noxious vapour. Mr. Adanson, in that critical season, made a light ptisan of the leaves of the baobob, which he had gathered in the month of August preceding, and had dried in the shade. He drank constantly about a pint of it every morning, either before or after breakfast, and the same quantity every evening after the heat of the sun began to abate; he also sometimes took a little of it in the middle of the day; but this was only when he felt some symptoms of an approaching fever. By these precautions he thinks he preserved himself, during the five years he resided at Senegal, from the diarrhœa and fever which are so fatal there, but which are, however, the only dangerous diseases of the place. The other officers suffered very severely, one only excepted, upon whom Mr. Adanson prevailed to use this remedy, which, for its simplicity, was despised by the others.

This ptisan alone, he also avers, prevents that heat of urine which is common in these parts from the month of July to November, provided the party abstains from wine. These hints respecting the virtues of this popular African vegetable infusion ought certainly to recommend it so far to notice, as to have them ascertained by the test of accurate experiment; for, though it may prove, like those of the ginseng plant, tea and tobacco, perhaps, more imaginary than real; yet it may posibly prove in some cases, if not of great use as a medicine, yet of some importance as a regale.

The fruit, he says, is not of lefs use than the leaves and the bark; the pulp which envelopes the seeds has an agreeable and acid taste, and is eaten for pleasure; it is also dried and reduced to powder, and thus used medicinally in pestilential fevers, dysentery, and bloody flux.

The woody bark of the fruit, and the fruit itself when it is spoiled, serves the negroes for an excellent soap, as they draw a lye from the ashes which they boil up with palm oil when it begins to be rancid.

Contrary to the general opinion of mankind, which is, that a slow growing tree yields hard and durable wood, it is found that the wood of which this immense tree consists is so soft as to be of scarcely any use. Those trees especially that have been decayed, where the wood afsumes the appearance of mere pith (which we may, indeed, fairly suppose is almost the only wood of this tree with which they are well acquainted, seeing that it would be a difficult matter to fell one of those trees by human exertion), the negroes

employ only for a kind of coffins, in which they enclose the bodies of their poets, musicians, and buffoons; which, being easily scooped out, they make use of as a kind of shell *sui generis*, or tomb, for this purpose. The description of persons above named, though they be much regarded while they live, as being supposed to poſsefs superior talents by sorcery, or a commerce with dæmons, yet, when they are dead, they regard their bodies with horror, and will not give them burial in the usual manner; neither suffering them to be put into the ground, nor thrown into the sea, or any river, because they imagine that the water would not then nourish the fish, nor the earth produce its fruits. The bodies, shut up in these trunks, become perfectly dry without rotting, and form a kind of mummies without the help of embalmment.

From the last-mentioned fact, it would seem to me probable, that the baobob tree differs yet more from the generality of timber trees than has hitherto been supposed. It is plain, that the outer rind for some distance within the bark (that part which answers to the *blae* of timber trees) is of a quality much more strong and durable than the internal substance of the tree. May it not happen, that the internal parts of this tree are at all times rather of a parenchymatous than a ligneous quality; and that the real woody fibres only occupy a small space within the bark? This is evidently the case with the cabbage-tree of the West Indies, whose outside fibres are firm, tough, and woody, while the inside is soft and pulpy. This also is in some measure the case with the species of palm-tree from which sago is prepared, although it differs in

this respect, that the fibres are in some measure intermixed with the parenchyma, from which they are separated by beating. This structure of vegetables is very general in the stems of herbaceous plants, whose strength in general consists in the fibres immediately under the skin; the inner substance only serving, as it were, to swell out these fibres, and to distend the circle, whose great diameter gives strength, without weight, to the stem to support the top on which the seeds are generally placed. This conformation is seen in its full perfection in rushes. Among the arundinaceous clafs of plants the mechanism is different. The stalks rise up in a tubular form, the pith in them being for the most part entirely wanting; to make up for which deficiency, they are bound together at moderate distances by means of knots upon the stalks, which confers upon them, by a beautiful mechanism that has not been as yet sufficiently explained, a firmnefs and strength that the same quantity of materials could not otherwise have pofsefsed.

A similar conformation, and, in as far as we are able to perceive, with a view to effect the same purpose, is observable in the young shoots of many quick growing trees, particularly the alder, which springs up with so much vigour the first year, that, were it not for the great thickneſs of its stem, consisting of a thin ring of ligneous fibres only on the inside of the bark, filled with an immense parenchymetous pith to keep it distended, the small quantity of woody matter that it contains could not have been sufficient to support its own weight. That this is the chief, if not the only use of the pith in trees, which

is observed to be much greater in the young shoots than the old wood, appears to me to be extremely probable at least. The alder tree affords a beautiful illustration of this position. Its progreſs, in point of dimension, at least during the first year, is out of all proportion to its future advances; but the inordinate dimensions it then acquires, consists almost entirely of pith, more than nine tenths of the diameter of the stem then being pith only, which, if taken out, forms a thin pipe of large dimensions. The next year, the ligneous fibres have become thicker and firmer; but, the pith having shrivelled up, or shrunk in its dimensions, if that be then cleared out, the pipe is found to be of leſs than half its diameter in the former year. Next year the pith has decreased to a smaller size, and so on it goes, diminishing in size from year to year, until at length it comes to a point, and is entirely closed up. The tree, having thus acquired a firmneſs of fibre and solidity of stem sufficient to carry the weight that it has to support, now advances with vigour after the heart has long been closed up.

The same proceſs is observed to take place with almost every other tree that grows, though in few is it so perceptible as in the alder. That the pith is of no sort of use whatever in grown up trees, is clearly demonstrated by the experiments of Mr. Forsyth of Kensington, in his mode of renewing decayed wood, many beautiful illustrations of which may be seen in pieces (in his poſseſsion) of those trees that have been thus healed up. In some instances that I have seen, a very large tree has been nearly decayed, and the whole of the stem entirely dead, except a few inches

in breadth of bark on one side, and a thin slip of the wood under it which it covered. The decayed part of the bark being cut away to the quick on both sides, and the wood under it to a small depth, and covered with his ointment, the sap no sooner begins to flow, than these edges swell out on each side, and, turning round inwards, form the beginning of a kind of roll, which soon acquires a sort of circular form, that in a short time appears like the stem of a young tree on each side, the growing bark adhering to it. The decayed wood within being regularly cut out as these scrolls, or rather young trees, advance in size, so as to give room for them, they continue to advance, augmenting in thickneſs with amazing rapidity from year to year; till at length, the decayed wood being still cleared away to give them room, they meet together; and their edges being pared off to suffer them to unite, they grow together, filling up the whole cavity from which the decayed wood has been cut out with sound solid timber, which differs in no other respect from the parent tree, than that it has in general advanced with greater rapidity, and that, when it is cut over, instead of one heart, which the original tree had, round which the rows of circular fibres could be distinctly traced, we now find two hearts, similar to it in all respects, with the circles running round each of them as regularly as in the first case before the two stems united; after which the fibres, without being discontinued, run round them both.

In this example, the original heart of the tree, which was at first a hollow cylinder occupied by pith only, after having been long closed up, is now totally

destroyed, and two new hearts are formed, in neither of which did there ever exist one particle of pith; yet the tree is in the greatest poſsible luxuriance. The pith of a tree, then, is by no means neceſsary for promoting the proceſs of vegetation; it must, therefore, have been originally intended for some other purpose. Like the *foramen ovale* in the fœtus of viviparous animals, it has been intended to perform certain functions at one period of life, which, being no longer wanted, closes up, as useleſs.

As no department of civil polity is of so much importance to the well-being of society as the proper education of females, seeing it is from them that all mankind derive their first notions of moral influence, I hope I shall perform an acceptable service to my country by laying before the public the following diſsertation on that subject by Mr. Fenelon, the great and good archbishop of Cambray, which, if it has ever before appeared in an English dreſs (and I think it is impoſsible it should not) has never fallen under my notice, and is of course much leſs known than it ought to be.

On the Importance of the Education of Girls.

NOTHING is more neglected than the education of girls. Custom, and the caprice of mothers, generally decide every thing concerning it. It is supposed that little instruction ought to be given to this sex, while the education of boys is considered as of the most eſsential advantage to the public weal; and, though scarcely fewer faults are committed in this than in the education of girls, yet all are convinced that it requires great understanding to succeed in it.

The most intelligent persons have studied to lay down rules for it. How many masters and schools do we see! What expences in the publication of books! in the researches after science, in seeking the best method of learning languages, in the choice of profeſsors! All these grand preparations have often more of appearance than of real solidity; they mark, however, the high opinion which is attached to the education of boys. For girls, they say, it is not neceſsary that they should be learned; curiosity renders them vain and affected; it is sufficient that they should know how to manage their families, and obey their husbands without arguing. They fail not to quote, as examples, several women whom science has rendered ridiculous; after which they think themselves justified in abandoning the conduct of their daughters to the indiscreet and ignorant management of their mothers.

It is true, care should be taken not to make them ridiculously learned women. Women in general have minds weaker and more curious than men; it is therefore improper to engage them in studies which they might pursue too strongly. They are not to govern the state, nor to make war, nor to enter into the sacred ministry; they may, therefore, paſs over certain extensive branches of science which belong to politics, the art of war, jurisprudence, philosophy, and theology. The greater part of mechanical arts do not concern them; for they are formed for moderate exercise alone. Neither their bodies nor their minds are so strong or robust as those of men; but, in return, nature has given them industry, neatneſs, and economy, to employ them tranquilly in their houses.

But what is the consequence of this natural weakneſs of women? The weaker they are, the more it imports us to strengthen them. Have they not duties to fulfil, and duties which are the ground-work of all human life? Is it not woman who ruins or keeps up the credit of families, who regulates all the detail of domestic affairs, and consequently determines all which most nearly touches mankind? Hence they have the principal share in the good or bad conduct of almost all the world. An attentive and judicious woman, who has a deep sense of religion, is the soul of a whole large family, for she preserves order as well in worldly matters as in those regarding salvation. Even men, who have the whole authority in public, cannot by their deliberations establish any effective good, unleſs women aſsist in the execution.

The world is not a phantom; it is an aſsembly of families; and who is there that can polish them with more exact care than women, who, besides their natural authority, and their aſsiduity in their houses, have the advantage of being born careful, attentive in detail, industrious, insinuating, and persuasive? But, can men hope for themselves any charms in life, if their closest society, that of marriage, should turn to bitterneſs? And what must become of children, who are hereafter to form the human race, if mothers should spoil them in their tender years?

These are, then, the occupations of women, which are not leſs important to the public than those of men; since they have a house to manage, a husband to make happy, and children to educate. Add also, that virtue does not leſs belong to women than to men.

Without speaking of the good or ill which they may do to the public, they constitute one half of the human race redeemed by the blood of Jesus Christ, and destined for eternal life.

We must also consider, besides the good that women do when well brought up, the ills which they cause in the world when they fail in having had such an education as should inspire them with virtue. It is certain, that the bad education of women does more harm than that of men; since the bad conduct of men has frequently its source in the bad education which they have had from their mothers, and from the paſsions which other women have inspired them with in a more advanced age.

What intrigues does history present us, what subverting of laws and manners, what bloody wars, what innovations against religion, what revolutions of states: all caused from the misconduct of women! This is sufficient to prove the importance of well educating girls: let us now seek for the means of doing so.

Inconvenience of the common mode of Education.

The ignorance of a girl is the reason why she is tired, and knows not how to amuse herself innocently. When she has arrived at a certain age, without having applied herself to any thing solid, she cannot have any taste or liking for it; every thing serious appears to her disgusting, and all that demands continued attention fatigues her: the love of pleasure, which is strong in youth, the examples of persons of her own age who are plunged in amusements, all seem to make her dread a regular and laborious life. In this first age,

she is wanting in experience and authority to govern any thing in the house of her parents; she does not know even the importance of applying herself to it, unleſs her mother should have been attentive to make her notice it in detail. If she be a gentlewoman, she is exempted from hard labour; she will only work a few hours in the day, because they say, without knowing why, that it is decent for women to work; but she will only do so because it may be the mode, and will never accustom herself to any continued work.

In this situation how will she act? The company of a mother who watches and scolds her, who thinks that she educates her properly by never pardoning her after any fault; who compromises, however, and who makes her suffer from all her own ill humours, who appears overwhelmed with domestic cares, constrains and disgusts her; when at the same time she is surrounded by flattering attendants, who endeavour to insinuate themselves by mean and dangerous complaisances, and comply with all her caprices, encouraging her in every thing that may give her a distaste to good. Piety seems in her a languishing occupation, and an enemy to all pleasures. How then will she occupy herself? With nothing useful. This inapplication becomes at last an incurable habitude.

Here, however, is a great vacuum, which, as one cannot expect to fill it with solid things, frivolous ones must supply their places. From this indolence, a girl gives herself up to lazineſs; and lazineſs, which is a languor of the mind, becomes an inexhaustible source of *ennui*. She accustoms herself to sleep one

third more than is neceſsary for the preservation of the most perfect health; this long sleep only serves to weaken her, to make her more delicate, and more exposed to disorders: while a moderate sleep, accompanied with proper regular exercise, renders a person gay, vigorous, and robust, which constitute, without doubt, the true perfection of the body, without saying any thing of the advantages which the mind draws from it.

This indolence and idleneſs being joined by ignorance, there springs from them that pernicious sensibility for diversions and amusements; it is even from them that an indiscreet and insatiable curiosity arises; for persons who are informed and occupied with serious things have only a moderate share of curiosity: that which they know, makes them despise many things of which they are ignorant; they see the nonsense and useleſsneſs of the greater part of those things which little minds, who know nothing, and have nothing to do, are so eager to learn.

On the contrary, girls badly brought up, and without application, have an imagination always abroad: for want of solid food, their curiosity turns with ardour towards vain and dangerous objects. Those who have understandings, worn blue stockings, and read every book which can feed their vanity; are wild for romances, for plays, for the account of chimerical adventures, wherein there is a good dose of profane love. They bewilder their minds in accustoming themselves to the bombastic language of the heroes of romances: by this also they ruin themselves for the world; for all these fine sentiments, all these generous paſsions, all these adventures, which the author of the

romance has invented at pleasure, have not any sort of connection with the true motives of action in the world, which decide on events; nor with the disappointments that may happen in whatever is undertaken.

A poor girl full of tenderneſs, and charmed with all the novels that she has read, is astonished at not finding in the world any real persons who resemble those heroes: she would wish to live like those imaginary princeſses, who in romances are always charming, always adored, always above feeling any of the common ills of life. What a disgust to descend from all this heroism to the base details of managing a house!

Some carry their curiosity still further, and pretend to decide in matters of religion, although they are not capable of it. But those who have not a mind sufficiently enlarged for those curiosities, follow others proportioned to them. They are eager to know every thing that is said or done; a song, a piece of news, an intrigue, the receiving of letters, the reading those which others have received. They wish to have every thing told them, and to tell every thing themselves. They are vain, and vanity makes them talk much. They are trifling, and this trifling prevents them from making reflections which would often cause them to be silent.

[*To be continued.*]

To the Editor of Recreations in Agriculture, &c.

SIR, October 24, 1801.

On a re-perusal of the first Number of the second series of your Recreations, I perceived in the eſsay respecting the varieties of plants, and on the

means of obtaining improved sorts of fruits, &c. that it was your intention in the course of the last summer to prove by your own experience (from some kidney-beans) whether by the selection of seed from the most productive and flourishing plants, the crop would be superior to one sown in the usual indiscriminate manner, or in any material degree beneficially affected by such selection. As I apprehend the time for completing the experiment is past, I beg leave to remind you of your promise, and to request you will communicate to the public, through the medium of your esteemed work, your conclusions on the subject, and whether your theory has received the necefsary support.

In the same efsay you also mention it to be your intention to try whether a mongrel kind of turnips could be obtained from a mixture of the plants of the Swedish turnip and some of the more common sorts. You will much oblige me by stating at the same time, whether this experiment has been made, and the conclusions that have arisen from it. I trust it is not necefsary to apologise for thus calling your attention to these subjects, but that you will rather consider this letter as a proof that your endeavours to raise a spirit of inquiry in your readers have not wholly failed, and that nothing but a strong desire to obtain complete information in these respects could have induced me to give you this trouble.

As the time for gathering the potatoe crops is now nearly over, I hope Mr. Phillips will not fail to communicate the result of his experiment, as to the production from sprits.

Should this letter be favourably received, it is pro-

bable that it will be succeeded by another of the same nature. I am, sir, your most obedient servant,

S. H.

In answer to the above, the experiment respecting the kidney-beans was made; but owing to the absence of the Editor at the time the beans were planted, he cannot rely with certainty upon it; for, although he was assured that his directions were strictly followed, he did not see it done. If no error was committed, however, the experiment did *not* turn out as he had supposed it would do, for he could perceive no sensible difference between the strength or prolificacy of the plants of either rows. He therefore recommends this subject to the farther attention of the curious. He has not had an opportunity as yet to make the experiment on turnips.

He has no doubt but Mr. Phillips will faithfully communicate the result of his experiments, if no accident prevent him from accomplishing it.

On destroying Insects.

A respectable correspondent from the northern part of the island, after having mentioned an ingenious device he had adopted for augmenting the effects of the sun's rays in accelerating the ripening of fruit, proceeds thus. "If the house is constructed in the way you recommend, so as to admit no air but from below, by attending to which, as far as the imperfect construction of an old glass frame which I put before a peach-tree on a brick wall would allow of, I had excellent fruit this season, and I am perfectly satisfied

that even in an ordinary season of sunshine, higher flavoured fruit may be obtained by attending to your directions as to retaining the heated air, than can be obtained by the aſsistance of any artificial fuel; you will observe it is of peaches or nectarines I now speak, but I make no doubt that by the contrivances which you propose (to which I have not yet sufficiently attended) forcing of every kind may be carried to much greater perfection than it has hitherto been; I am so much pleased with the result of the imperfect attempts I have made to make the most of the heat of the sun (the only heat, in my opinion, which can produce high flavoured fruit) and so much edified and encouraged by your Recreations on the subject, that I am building a little bit of wall this season for the purpose of making a more compleat experiment than I have hitherto done; I cannot afford to garden on a great scale, but amuse myself with trying experiments on a small one.

I have been much entertained with your account of different insects, and of the manner of destroying them, to which I have attended for some years past, and I think I have hit (by chance in some degree) on a method which promises to rid me of some of the most destructive. I have been in the custom for some years of hanging glasses (such as are used for flower-roots) in Spring to catch wasps, and in these glaſses, along with the wasps, I have destroyed immense numbers of flies of all shapes and sizes; from large butterflies and moths, down to the musquito; and observe that my trees, particularly the palm-trees on the wall, are much less infected than those of my neighbours: and as I conclude that most of the caterpillars, worms,

&c. at one period of their existence are in the fly state, in which state they copulate and lay their eggs, the destroying of them in the spring before they have done this, must at last eradicate, or at least greatly diminish the breed. I hope you will excuse this scrawl, which I have some doubts of your being able to decypher, and yet I shall give you a few lines more: this Spring I observed an insect which I had never seen before; it was about the size of a large bee (commonly called *humble bee)*, colour green and yellow, with some white spots on the back; it hovered over the flower, and extracted what it required without alighting, in the way that I understand the humming bird feeds; I endeavoured to catch it, but was as unsuccefsful as my brother Knight in pursuit of the emperor of Morocco (vide Peter Pindar).

The mode of destroying insects above described, appears to me to be one of the most judicious that I have ever yet met with, and, were it universally adopted, I am persuaded it would prove extremely efficacious; I therefore warmly recommend it to the attention of my readers. The attempt to catch flies by means of honeyed water, or other sweets at the end of the season, seldom can prove succefsful, not only because the bottles must be soon choked up by the great numbers then killed, if they do take to the water, but also because they become then indifferent about it, on account of the sweetnefs of the fruits at this season of the year. At the time in which I write I have about a dozen bottles thus filled, that have hung upon a wall covered with ripe grapes more than a fortnight, without having killed a hundred flies, though they are swarming

in thousands upon the grapes, the juice of which is indeed as sweet as any syrup I could make for them; whereas, during the early part of the season, luscious fruits being then wanting, they will be the more easily attracted by the taste of sweet syrups.

I have not remarked the insect above described.

Reading Memorandums.

"To "die in the Lord" is to die in the faith and obedience of the gospel of Christ. All who are of this temper and conduct, however they may differ with relation to sentiments of doctrine, or modes of worship; however they may be divided into distinct profeſsions of separate societies; they are still united by the endearing appellation and bonds of christianity, and will be joint partakers of the joy of their Lord."

"By sickneſs the strength of the mighty is bowed down; the vigour of life is withered; and the bloom of the beautiful is blasted."

"Such as die in the Lord shall be fixed in those happy regions from which every thing that can disturb their rest shall be excluded for ever."

"Those virtues which were here prevented by the blasts of temptation from growing up into full maturity, shall, when transplanted into more favourable climes, and beneath a celestial sun, rise into complete excellence and perfection."

"An obedience so imperfect as ours cannot in itself pretend to the ineffable glories of the heavenly world: these must proceed alone from the boundleſs mercy of God."

"At that important period when the kingdoms of the earth shall be destroyed; when all the productions of human genius shall die; when mighty mountains shall tremble on their base; and the present beautiful frame of nature be only one vast undistinguished ruin; and when the whole assembled race of Adam shall appear before the tribunal of Jesus; at that important period the good deeds of the pious, the upright, the benevolent, shall be had in delightful remembrance."

"Let us endeavour to imitate the example of those who have "died in the Lord," that thus we may obtain the same salvation. Let us consider those that have gone before us, and who are enjoying the fruits of their victory, as looking down from their spheres of dignity and of bliss, and calling upon us to follow them as they followed Christ."

"We are led by the consideration of the benignity of God, and the harmony of his government, to conclude, that whatever appears calculated to enlarge the circle of social felicity is a part of that same constitution established by the great author of nature."

"Nothing truly excellent can be acquired without attention and labour."

"Heaven and earth, angels and men, are all united as one large family under the authority of the same common father."

"Involuntary errors and infirmities are the common lot of humanity, and for these there is a just foundation for hope in the divine mercy."

The favours of Arator, Ambidexter, Trueman, and X. Y. are acknowledged.

33.

NOVEMBER 1801.

RECREATIONS, &c.

N° 3. Second Series, Vol. II.

On the Symbolic Character.

[*Continued from page* 101.]

THE personal pronouns in every language consist of three claſses or divisions. The *first* is employed to denote the person from whom the discourse proceeds, and is called the pronoun of the FIRST PERSON. This, in the English language, is denoted by the single letter *I* when one person addreſses, or the word *WE* when the discourse proceeds from more than one: the first we call the *singular*, and the second the *plural* number. The word substituted for the name of the person addreſsed is called the pronoun of the SECOND PERSON, and is *THOU* in the singular, and *YE* in the plural. It has been thought unneceſsary to make any variation for the *gender* of these pronouns, probably on the presumption that the parties are known to each other. When the discourse respects parties that are not supposed to be present, the word substituted for their name is denominated the pronoun of the THIRD PERSON; and in regard to this pronoun, it has been thought neceſsary in most languages to

make a distinction of the word to denote gender. In some languages this distinction is two-fold only, as in the French, Italian, and Spanish; but in others, particularly the English, it is three-fold; the word *HE* denoting males, *SHE* females, and *IT* neuters, or beings either devoid of sex, or whose sex is not intended to be specified.

Besides these variations, there is another which is common to all the three persons, as well as to nouns of every donomination. When the object is represented as the agent or the efficient cause of any action, it is said to be in the *nominative* case; and when it is represented as the pafsive object on which the action is exerted, it is said to be in the *accusative* case. Though we have no variation of our *nouns* in this respect, we have a distinct word for the *accusative* case in our *pronouns*; thus *I* the nominative is changed into the accusative *ME*, and *THOU* into *THEE*, with their plurals, and so on of the others, as in the table. Example, *I* (nom.) struck *HIM* (accus.)—*HE* (nom.) abused *ME* (accus.)

There are yet two other variations; which, in the pronoun of the first person, are, *MY* and *MINE*, that have been called by some grammarians *definitives* and *possessives*, which names, in compliance with custom, I have adopted in the table. These variations all affect the pronouns of the second and third persons, as well as the first, and both singular and plural numbers in all genders, as will be readily perceived by glancing over the table, page 166.

In that table, if you advert only to the *words*, and disregard the *signs*, you have a complete enumeration of the English personal pronouns according to our

spoken language, with all their variations. By examining it in detail, you will perceive, that, in as far as regards the pronouns of the *first* and *second* persons, every thing is regular and proper, without either deficiency or redundancy. But in the pronoun of the *third* person several deficiencies are discoverable. In the masculine gender, for example, the word *HIS*, which is properly the *possessive* singular, stands alike for the *definitive* and *possessive*. In the feminine gender, we perceive a similar deficiency; as the word *HER*, which is properly the *definitive*, is also placed as an accusative. The neuter gender is still more deficient, as the word *IT* stands alike for the *nominative*, *accusative*, and *definitive*.

The deficiency, however, in the *plural* number is still more conspicuous; as the words *THEY*, *THEM*, *THEIR*, and *THEIRS*, are employed alike to denote all the three genders, without the smallest mark of distinction.

When we advert, however, to the distinctions respecting gender that ought to be indicated by the pronouns, we discover, that the deficiencies of our language in regard to this very important clafs of words is infinitely greater than most people will be disposed to think could pofsibly be tolerated. We have already seen (page 98) that many of our nouns admit a five-fold distinction of gender: as, for example,

	PERFECT.		IMPERFECT.	
Indefinite.	*Masculine.*	*Feminine.*	*Masculine.*	*Feminine.*
1	2	3	4	5
Cattle.....	Bull.....	Cow.....	Ox.....	Spayed heifer.
Sheep	Ram	Ewe.....	Wedder....	Spayed ewe.
Horse.....	Stallion..	Mare	Gelding....	Wants a name
Man for mankind ..	Man	Woman	Eunuch....	Wants a name

But though we can make the distinction in these cases respecting the *noun*, when we come to employ the *pronoun* all these distinctions are lost. Thus, were we to say, and Pharaoh spake unto his chief eunuch, and said unto *him*, viz. the eunuch; and *he* (the eunuch) said unto *him* (Pharaoh), and so on; *he* and *him* must be interchangeably applied to both, without any mark of distinction, which occasions much perplexity and indistinctnefs.

To obviate this inconvenience, therefore, in devising marks for the pronouns, it would be the easiest thing imaginable to substitute the same marks for gender, as those which denote it in the nouns; as in the table. In this table, the marks denoting the masculine in the pronoun of the third person, when meant to apply to the genus only, as a substitute for the words cattle, sheep, horse, man meaning mankind, and so on, as including both genders, have both gender marks, which designate the precise meaning; the perfect male has the mark of the masculine gender; the female of the feminine gender; the imperfect male is denoted by the mark of the imperfect masculine gender; and the imperfect female by the same in the feminine gender; and the neuter by an entire omifsion of all marks of gender. According to this arrangement, the idea meant to be conveyed by the writer can at all times be denoted with the utmost accuracy and precision; although the reader, when he puts it into words, must make use of the inaccurate expref-sions which his language admits of.

That the reader may trace the principle which regulates the formation of the characters in the table,

let him observe, that the general form of the pronoun differs from that of the noun and the verb by having the two perpendicular strokes which form the basis of all the three characters connected by means of a horizontal line towards the bottom, but a little above it; and that the distinctive character is denoted by the left hand perpendicular line. Hence the pronoun of the *first* person is a simple straight line, with a projection to the left hand at the *bottom*, which remains unvaried through all its inflections. The pronoun of the *second* person is, in like manner, indicated through all its inflections by a mark on the left hand at the *middle*; and that of the *third* person by a mark on the left side at the *top*.

With regard to the inflections; that denoting the accusative case is invariably distinguished from the nominative by having a mark *above* the middle of the horizontal connecting bar. The *definitive* is again invariably denoted by a mark *under* the middle of the horizontal bar; and the *possessive* is as invariably denoted by a mark crofsing the middle of the horizontal bar. In all other particulars each of these exactly resembles the nominative.

With respect to the further distinctions, the plural is in all cases distinguished by a *dot* between the two legs. For the nominative at the *top*; the *accusative*, *definitive*, and *possessive*, have the plural distinguished from the singular by having a *dot*, instead of a *line*, above or below the connecting bar, as in the table.

The genders are denoted by the same marks placed within the character in its upper division, as were before specified for the nouns, page 98, which need

not be here repeated, as they are sufficiently obvious by inspection of the table.

A Table of the personal pronouns, with their derivatives, as they are written in English, according to the alphabetic mode, and as they might be denoted by Symbolic characters; in which last mode the genders, as well as person and number, are distinctly marked through all their variations.

In the table, the word that we are now obliged to employ in English for denoting the idea indicated by each of the characters there marked, is placed below these characters respectively; by glancing over which the great deficiency of our language will become apparent. In this table all the distinct pronomial words that we have are printed in capital letters; the words that are printed in italic characters are all wanting in English; so that we are under the neceſsity of supplying these wants by aſsuming some of the *proper* pronomial words (that are printed in capitals) and making them perform a double, triple, or quadruple office. Thus, the word THEY denotes alike a plurality of animate beings indefinite, a plurality of males, and of females *perfect*—of males, and of females *imperfect*—and a plurality of inanimate objects, or neuters; so that this one word must be employed indiscriminately to denote no leſs than *five* distinct ideas that can be readily discriminated from each other; each of which would be clearly distinguished by the use of this character. Thus  *(THEY)* would clearly indicate a plurality of the objects indicated by the noun, for which it became a substitute, without distinction of sex;  *(THEY)* would indicate the same plurality of perfect males only;  *(THEY)* would do the same of perfect females;  *(THEY)* the same of castrated males;  *(THEY)* of imperfect females, and *(THEY)* of inanimate objects, or those whose sex is not meant to be indicated. The same thing takes place respecting the words *them*, *their*, and *theirs*, each of which is employed to denote an equal diversity of objects. In like manner the words HE and SHE must be each of

them employed to denote *three* distinct meanings. HIS to denote no lefs than *six*; as it must be alike employed to denote the *possessive* and the *definitive* in the *indefinite*, *perfect*, and *imperfect* masculine gender. The word HER stands for four meanings, denoting alike the *accusative* and *definitive*, both perfect and imperfect, and IT three, being alike applicable to the *nominative*, *accusative*, and *definitive*; all of which will appear plain by inspection of the table.

It will require some practice to enable the reader to perceive the distinct perspicuity that would result from the use of these neceſsary distinctions. But this will be obvious, upon a very little reflection, to any person accustomed to speculations on language.

I might proceed with these illustrations a great deal farther; but, as the above will be sufficient to satisfy *one* claſs of readers, to *them* it would be unneceſsary; to *others*, longer details would become only tiresome. I shall therefore add nothing farther on this branch of the subject, than to observe that, besides the relief to the memory that is afforded by the use of derivatives and compounds in the formation of words, a vast deal is done in that way by the aid of *annexes* and *prefixes*; that is, initiatory or terminating syllables, such as un--im—ing—ed—ly—ty, and so on; and, with regard to this particular, the surprising coincidence that prevails in different languages must have struck every person as a singularity, who has turned his attention to the acquisition of many languages; for it will appear, that there is scarcely a characteristic termination in one language, that has not a termination corresponding to it in another; so that these terminations,

like names, have only to be translated, and they are found all nearly to assume the same place in every language. Thus, in humani-*tas*, Latin; humani-*té*, French; humani-*ta*, Italian; humani-*dad*, Spanish; humani-*ty*, English, the syllables detached in all cases denote a similarity of meaning throughout the whole of the languages to which they respectively belong, and so on of others. This circumstance, then, when adverted to, would tend greatly to facilitate the language of signs; for in constructing a dictionary of this language (the only part of it which presents any serious difficulty) were the meaning of these annexes or prefixes to words to be once sufficiently understood, so as to admit of a clear and distinct explanation in every case, the use of these signs, when thus explained, would soon become easy and familiar not only in one but in all languages.

I have now arrived at the *pons asinarum* of this undertaking, the great stumbling-block that will, in all probability, for ever prevent it from being carried into practice; that is, the difficulty of constructing (not that of arranging the signs of) a dictionary for this purpose. Not that there occurs in this enterprise any difficulty that does not present itself in an attempt to form a dictionary of language for any other purpose where accuracy and precision are aimed at; but only that in this dictionary the meaning of words must be accurately ascertained, or the defects will be much more palpable than in any other case. It is not, in short, more difficult to construct a dictionary for this than for any other purpose where it is to be *equally well done*; but it is not so easy in this case

to commit errors with impunity as in any other. When a person who is qualified for the task shall try, by this test, but a single page of any of those dictionaries of the English language now in use, he will be perfectly astonished at the difference that must be made in it before it could be of any use; and his spirit may, perhaps, sink within him at the prospect of the vast distance by which he must, if he hopes to succeed, surpaſs those who have acquired a reputation little short of universal for their efforts, though wonderfully imperfect, in this line. What right have I, he might perhaps say to himself, to suppose that my knowledge can so far surpaſs that of others whose mental faculties have been more powerful in many respects than any to which I am conscious of having a claim?

Such, I know, have been already the reflections of one who bestowed a little attention on this subject. And what was it that enabled him to perceive at that moment, and not before, the immense distance between the perfection that might be attained, and that which had been already reached by our best lexicographers? Nothing else aſsuredly, but the neceſsity he found of considering the subject under a point of view totally different from what either he or others had done till that moment: and what stronger argument than this could be adduced for urging him to proceed in his career? If, from a slight view only of the subject, he discovered defects innumerable, he discovered at the same time the source from whence these defects had originated. Instead of having his attention directed to the arrangement of syllables and sounds, and of thus being induced from the languor of mind that

is naturally felt by every man of talents when he engages in an unpropitious task which must consist in a great measure in the labour of transcribing, and the inevitable distraction of mind which that produces, he found himself under the neceſsity of applying his whole powers to discover the true and genuine *meaning* intended to be conveyed by the words; to analyse, as it were, the expreſsions; and, by placing them in different positions somewhat after the manner that the letters are employed in an algebraic equation, be thus brought at length to discover with certainty truths which could not be made manifest by any other proceſs that had been attempted. Such were the effects of but a slight investigation; and I will readily confeſs, that it laid open to my view a source of improvement in all those operations in which *mind* is concerned, on account of the precision of ideas that would be thus attained, and the perspicuity of expreſsion that must be the neceſsary consequence, which I had hitherto conceived must be for ever unattainable by man: nor was there ever an object that I had so much at heart, as to be able to induce a person qualified for this undertaking to attempt the task. Had I myself poſseſsed powers of that kind, I should, without hesitation, have applied my whole efforts to that end; because the leisure that I could have enjoyed could in no other way have been so well employed for the benefit of that community of men of whom I am so small a part; but, as this far exceeded my own powers, it was totally out of the question: and, as the person to whom I allude, and who is, I think, equal to the task, is under moral obligations that must not be dis-

regarded to apply his attention another way, I can only, as I now do, regret that circumstances, which, when physically considered, appear to be by no means insurmountable, should stand in the way as a bar to this, as to many other practicable improvements.

I am anxious for the completion of this great undertaking, not on account of the universal character only, the introduction of which would be indeed a neceſsary consequence of it; but chiefly on account of the perspicuity and precision that it would introduce into the mode of thinking and reasoning among all nations (for it would soon be translated into other languages); so that I should consider it as one of the most useful philological researches that ever was undertaken by man. I have now said enough on this head, and here I leave it; with this single observation, that the person I allude to is now alive, and I believe in good health; and is not so far advanced in life as for that to prove an objection to his engaging in this work: nor would it be, I apprehend, impoſsible, under a proper arrangement of circumstances, to induce him to undertake it.

A few words more will finish all that I think it neceſsary to say on this subject: a subject that has often engaged the attention of speculative men in various countries, each of whom has been sensible of the physical poſsibility of something of the kind that I have explained, but who have each treated it in a different manner. After the outlines of the above had been committed to paper, and indeed published in part in the fourth volume of the Transactions of the Philosophical Society at Manchester, a book was published

in France with the same avowed intention: this I have seen; but, instead of the simplicity that I aim at (which is, to leave oral language in every case the same as it would be if no such character existed, and to follow the order that custom has introduced in this respect, rather than to controul it) the French system aims at refinements in these respects which to me appear to be not only unneceſsary, but such as would prove obstructive to the progreſs of that mode of writing, by rendering it difficult and intricate. Much respect, however, is due to the author for the ingenuity discoverable in these arrangements.

I think it neceſsary also to observe, that what I propose is not at all of the same nature with that which was proposed by the good and learned bishop Wilkins, in his very ingenious eſsay towards the formation of a universal language. In that eſsay, which discovers a stretch of thought that few persons are capable of attaining, the author proposes totally to alter the form and construction of language in general, and to reduce it to philosophical principles; a thing that I conceive to be altogether impoſsible ever to accomplish. *My* object is merely to introduce an universal *character*, leaving all languages as they are, liable to such alterations, corruptions, and refinements as the caprice or ingenuity of men shall from time to time suggest. It is, in short, nothing more than an improvement of the same kind with that which was effected in Europe a few centuries ago by the introduction of the arabic numerals; a thing that was effected without noise or trouble of any sort, and without occasioning any alteration in the spoken language

of any country; the wonderfully beneficial effects of which improvement have been long felt, though distinctly recognised only by a few.

Whether the principles above developed be the same with those that occurred to the marquis of Worcester in his Scantlings of Inventions, I cannot tell, but it must have been somewhat of a similar sort; for the system here explained could have been scarcely more justly characterised, had it been written on purpose, than his description is, which runs in these words: § 32. "How to compose an universal character, me- "thodical and easy to be written, yet intelligible in "any language; so that if an Englishman write it in "English, a Frenchman, Italian, Spaniard, Irish, "Welsh, being scholars, yea Grecian or Hebrician, "shall as perfectly understand it in their own tongue "as if they were perfect English; distinguishing the "verbs from nouns, the numbers, tenses, and cases, "as properly expreſsed in their own language, as it "was written in English." It may be proper, however, to observe, that the idea of it was not suggested to me by this hint; for it was only a few days ago, and after the greatest part of the above had been written out, that this paſsage attracted my notice. The idea of it originated with me precisely as has been stated above.

Were such a character to be ever introduced into general use in Europe, as has been done with regard to the Arabic numerals, benefits nearly of the same kind with those that have resulted from the use of those numerals, but much more extensive in their application, would accompany that practice. By the

use of that character, which would be universally diffused with an astonishing rapidity as soon as it was practically adopted in any one country, all mercantile transactions could be carried on between the individuals of all nations with a facility and precision that have been hitherto deemed utterly unattainable. The time that must be spent, and application that must be bestowed, upon the acquisition of languages would be saved; the trouble of translations avoided; and the mistakes and errors arising from mistranslations obviated. Principals themselves might in all cases correspond directly, without the intervention of clerks, or substitutes of any kind; for a letter in that character could be written in lefs than one fourth of the time, and compreſsed into a similar diminution of the space that must now be employed for that purpose.

With regard to literature in general, the facilities that this would open for the acquisition of knowledge would be still more considerable. The whole stores of the literary republic would then constitute but one maſs of accumulated treasure equally acceſsible to every individual of that community, without distinction of country or of language. Every one could addreſs himself immediately to another, without danger of being misunderstood or misrepresented. Books, in the language of whatever country they had been composed, would be equally legible throughout the whole of the nations that employed this character; and they might be so printed as to contain as much matter in one page as now constitutes nearly half a volume, and still be as little fatiguing to the eyes, and more instructive to

the understanding, than they now are. The expence of reading being thus diminished, it would be brought within the reach of every one who had a mind susceptible of culture; so that the knowledge of every discovery that the ingenuity of man could devise would then be as widely diffused in the course of one year, as it now can be in the course of half a century.

Nor would the facilities that it would afford in the other concerns of life be leſs than those already specified. The words of an orator could be taken down, by any one of his hearers, with the utmost facility as fast as he could pronounce them; not in that inaccurate manner which must ever result from the use of *short-hand* as now practised, but with the most perfect accuracy and precision poſsible; so that not a single idea that dropped from him could ever be either lost or misrepresented. An author whose ideas flowed upon him in abundance, instead of proceeding in his compositions with that slowneſs which engenders languor and inattention, could go on with all the fire and rapidity that the ardour of his native genius suggested: a traveller, instead of being loaded with whole volumes of memorandum-books, and spending many hours each day in minuting his observations, which procrastinates time, accumulates expence, and subjects him to retardments and to pillage in a thousand ways, could have an equal number of observations minuted on a few pages of a pocket-book; and these minutes could be entered in it in the few short intervals of time that must neceſsarily occur in preparing victuals and other neceſsary articles. I might go on, after this manner, to point out similar facilities which it would

offer in regard to other particulars. But I forget not that, however obvious these may be to the contemplative mind, to others, the more that is said will tend only to make them be the more convinced of the impoſsibility of the thing; because, until it shall be actually exhibited in practice, nothing can satisfy them that it ever could be practised, or it would already have been done. In vain should I urge the example afforded by the arabic numerals, of the falsity of this mode of arguing: to the blind no colours can be made palpable: the light of the sun itself is to them an universal blank.

Let it not, however, be supposed, that I mean to say that a symbolic character could ever be contrived that should answer, of itself, *all* the purposes that may be wished for in society. No invention of man can ever be perfect; the most that we can do is to aim at the fewest imperfections. Occasions sometimes occur, in which the *sound* of words, and harmony of numbers, in a particular language, constitute a material part of the excellence of a composition; which, if lost, would greatly diminish its value. These harmonies, then, as they depend upon the construction of the language lending its aid to heighten the ideas conveyed by the words, must be considered as mere localities, which cannot be brought within the rules of an universal character. These constitute a sort of adjunct, like the music of a song, that must be conjoined with the words (which indicate the meaning) before its full effect can be experienced. In this way, the Iliad of Homer, if written in the universal character, might be rendered intelligible to people of

all languages much after the same manner as the lyric pieces of Metastasio may be read by one who understands the meaning of the language in which they are written; but, if he wishes to feel the full extent of their power, the music must be conjoined with the words: he must hear them sung. Just so with Homer: those who wish to feel the power of his verses must read them in the Grecian language, in which alone the beauty of the ideas can be felt in their fullest extent. The universal character, therefore, is calculated to do nothing more than to addreſs the understanding, and inform the judgment, of all those who use it. With regard to harmony of *sounds*, this part of the beauty of every composition must be in all cases confined to the language in which it was composed; and even with respect to that language, it ought by no means to abolish the use of the alphabetic mode of writing in regard to poetic compositions; seeing that that is the best mode of perpetuating the knowledge of sounds that man has yet been able to devise. Should this mode of writing then be introduced, I can see no neceſsity for its banishing the other; but much the reverse. Let it be used, as the arabic numerals now are, wherever it shall be found more commodious, and better adapted to convey our meaning than words; but not otherwise. Thus, for example, when I write 1798, it conveys a clearer idea to my mind of the amount of the number, than if it had been written in words; but did the rhithmus require that I should read it one thousand seven hundred seventy and eight—or seventeen hundred and seventy eight—or seventeen hundred three score and

eighteen; and that it would by no means answer my intention if it were to be read one thousand seven hundred and seventy-eight, in that case it becomes neceſsary for me to abandon the symbolic mode of notation, and to adopt the alphabetic, though by far the most troublesome of the two. This practice we now universally adopt; and I can see no reason why it should not be adhered to respecting the universal symbolic character, were that also introduced into general practice. In short, I consider it to be one of the greatest recommendations of the improvement proposed, that it alters nothing in respect to the established order of things, either in regard to our written or our oral language: it would only afford facilities of inconceivable value to such as chose to avail themselves of it.

I wish, before I conclude, to submit one other consideration to those who feel themselves disposed to disregard this proposal merely on account of the supposed difficulty of accomplishing it. We all know, that there was a time when the art of writing of any sort was totally unknown to any individual of the human race; and we know, in fact, that at this moment there are many nations of men who know nothing at all of it. Should any person, then, who had learned the language spoken by these people inform them, that it would be an easy matter for him to communicate to another person at a great distance, by means of a few characters easy to be traced upon a piece of bark or paper, the exact purport of every word that had paſsed in a conversation that had taken place between himself and others, without ever

leaving their company, or coming within many miles of the person to whom the communication was to be conveyed; would they not conceive it to be a vain boast, that could never be accomplished by him: or that, if it could be done at all, it must be done by enchantment; for that it certainly exceeded the human powers ever to accomplish? Yet, every person in Europe now knows that this is not only not impoſsible, but that, without any imaginary supernatural aid, it is so easy that a child of ten years of age is capable of attaining it completely. Let us not then be deterred from entering upon this investigation because of *supposed* difficulties, which would disappear like the spectres of imagination as soon as they should be seriously contemplated. For my own part, the only circumstance that has appeared to me truly *wonderful* in the course of this investigation is, that mankind, having the facts that I have stated before their eyes, should have continued so long to disregard them, and thus to deprive themselves of benefits of estimable value, which were evidently within their reach, and of which I can have no doubt that our descendants will one day avail themselves, whether it shall be done in our time or not. Let it be recorded, then, that this was written in the first year of the nineteenth century.—*Dixi.*

The will of Kang-Hy, emperor of China; translated from the French version.

INTRODUCTION.

IGNORANCE has, by some, been said to be the mother of devotion; with greater justice might igno-

rance be called the mother of vanity and self-conceit. Knowledge, by unveiling the weakneſses as well as the concealed powers of the human mind, inspires a diffidence respecting self when compared with that of others, because they are often found to excel where they seemed at first sight to fall greatly short of excellence; and this never could be felt by the uninformed mind.

If personal self-love, combined with ignorance, be the abundant source of vanity and pride among individuals, local prejudice is a still more abundant source of *national* vanity; because the means of information that alone can correct these are still leſs within the reach of the individuals who constitute the bulk of a nation, than the knowledge of individual powers and incidents: hence erroneous judgments in this respect are more frequent as well as more extravagant. If we laugh at the Chinese (a people who, from the local situation and fundamental laws of the empire, are in a great measure precluded from a free intercourse with other nations), for their vanity when they paint those of their own nation alone with two eyes, while the individuals of all other countries are represented without any eyes, except Europeans, to whom they allow but one—what ought we to think of those persons among ourselves who look with ineffable contempt upon every practice in other nations which differs from their own, when we consider that we, by our more extended communication with other nations, have so much better means than they have had of correcting these erroneous decisions, by remarking, if we will, the beneficial tendency of many of those particulars in which they differ from us. Instead of inconsiderately laugh-

ing at and condemning (as children and fools always do) every practice among others that differs from our own, it is the province of true wisdom to mark these variations, carefully to trace their beneficial tendencies, and to discriminate those particulars in regard to which they are hurtful: thus shall our knowledge be enlarged, and our understandings enlightened.

That the Asiatic forms of government differ widely from those which have been familiar to the people in Europe for ages past, is a truth that cannot be denied: that they are greatly inferior to them in *theoretic* excellence will scarcely, I suppose, be disputed; though some persons may doubt respecting the comparative efficacy of the one or the other in facilitating the great ends of government, viz. that of promoting the peace and tranquillity of states, and augmenting the happiness of individuals. If the stability of empires, the increase of population, and the power of drawing from the earth abundant sustenance, be admitted as practical proofs of good government, the advocates for European government will find little room for self-applause on the perfection of their system: and if they attend to the steady influence of a spirit of piety and beneficence diffused universally among all ranks of people, compared with the never-ending fluctuations that result from the baseless theories of irreligion, it is presumed they will find little room to compliment themselves on the improvements that they have made on the state of society in general.

If I were required to make a new arrangement of the different systems of government that have been exhibited on our globe, I do not know that I could do

it better than by ranking them in three classes, which might be denominated the *patriarchal*, the *political*, and the *despotic* governments. By patriarchal I mean those governments that naturally arose from the circumstances in which the parties found themselves placed, in which there subsisted a mutual confidence and kindness between the governors and governed, and where nothing like a definite, far less a written contract between them subsisted; but where it was universally understood, that protection and submission were alike indispensable duties on the parties, similar to that between parents and children; which could not be departed from without transgressing the laws of God, who was considered by all ranks as the supreme rewarder of good, and avenger of evil actions in this world; and in whose power, goodness, and justice, all acquiesced. This system of government, then, necessarily implies a simplicity of manners and singleness of heart that is incompatible with a state of extreme depravity among men. From every circumstance that history records we have reason to believe, that the ancient monarchies in Asia and Egypt were all referable to this class; vestiges of which are to be perceived in maxims that have influenced many of even the modern governments of Asia, though much debased by the intermixture of foreign influence. The most striking characteristics of this form of government are, great pomp in the rulers, and among the people a veneration for their princes little short of adoration; a powerful sense of piety and moral obligation universally; a spirit of peaceful tranquillity, general plenty, sober industry; and, of course, a wondrous population in the

state, and fertility of the territories. The accounts of ancient Babylon, Nineveh, Memphis, and of the armies of Semiramis, Ninus, and Nebuchadnezzar, sufficiently evince this. The same circumstances are now observable, in some degree, in China, whose population constitutes near one third part of the whole globe.

Under the name of *political* governments, I would arrange all those systems that originated in the speculations of philosophy, in which things were to be arranged *a priori* according to certain systems that were devised by ingenious men, and who, instead of following nature with singleneſs of heart, set themselves proudly to correct her supposed aberrations, and to regulate by *wise* laws the imperfections of the universe. This idea, like many of the other ingenious devices of men, originated in Greece, and with her philosophy and arts has been transmitted to future ages. The characteristic features of this form of government are, a perpetual struggle for power between the higher and the lower ranks of the people; domestic ambition and discontent in families; a never-ceasing effort among individuals to depart from their own station in the community, and encroach on the province of others; private diſsensions, civil contentions, wars, and revolutions; in consequence of which the culture of the soil is neglected, the means of subsistence diminished, domestic comforts curtailed, and population decreased: yet this is called *liberty*, and the most perfect theoretical system of government that wisdom itself could devise.

From the misery that is the neceſsary result of th

system of government, and the corruption it engenders, has been generated the third, which I have denominated the *despotic*; in which, dominion, originally acquired by cunning, is preserved by power, by corruption, and by all the insidious devices that a cunning policy can invent; which, as it is the refinement of corruption, is undoubtedly the most destructive of all governments.

In giving this slight sketch of the different kinds of governments that have hitherto appeared upon our globe, I make no distinction arising from the names by which rulers have been called, or the designations that have been invented to mark certain unesential forms. I do not appropriate the Grecian word despotic to any particular form; for despotism may exist under many different forms: and tyranny is alike detestable in my eyes, whether it be exercised by many or by few; under the name of decemvir, emperor, or consul: nor is it with me a matter of any consequence, whether a nation owes its peaceful tranquillity and unasuming prosperity to the continued exertions of a beneficent succesion of princes, or to any other cause that can be as steady in its operation and as permanent in its influence. I wish, however, that we would learn to discriminate between the government of one man under the patriarchal system, and that of *one person* of uncontrouled power under the corrupted state of despotism as above defined, which seems not to have been sufficiently attended to in the seminaries of education in Europe.

Be that as it may, I conceive it to be a matter well worthy the contemplation of European readers, to be

enabled to see what were the predominant circumstances that influenced the mind of an eastern monarch who had long swayed the sceptre of a mighty empire, at the close of life, with the prospect before his eyes of very soon bidding an eternal adieu to all that can prove either alluring or disgusting in this life. The following paper affords such a picture: for I have not heard it surmised, that any suspicions are ascertained of its not being genuine. It was first translated from the Chinese language into French by a missionary in Pekin, for the accuracy of which version I cannot answer, but which there is every reason to believe is correct. The English version is done by a friend, to whom I have been indebted for many others.

The will of Kang-hy, Emperor of China, and of the two Tartaries, eastern and northern. Translated by Joseph de Grammont, missionary at Pekin.

To Monsieur Agote, Director of the Royal Company of the Philippine Islands at Canton.

Pekin, Sept. 20, 1795.

SIR,

It is high time that I should acquit myself of my engagements with your excellency. This year I have happily finished the translation of the will of the emperor Kang-Hy, which I had promised you. However imperfect it may be, I take the liberty of offering it to your excellency, persuaded that the more enlightened your understanding may be, the more you will excuse those faults which may wound the delicacy of your taste.

Although I always work with pleasure when I am employed for your excellency, I will not diſsemble but that this work, short as it may appear, has given me a great deal of trouble. The laconicism of the Chinese style, its metaphorical expreſsions, its sudden transitions, and its dry manner of presenting objects, have disgusted me a thousand times.

To smooth my labours, and to be more at my ease, I could, it is true, have followed the examples of those translators who, without binding themselves to follow step by step their original, seize only the general scope of his ideas, and upon this foundation work after their own taste and genius. By this means I should have added more connexion to my work; I should have given a greater body and extent to the historical facts; I should have entered with greater detail into every thing which concerns policy, religion, and the manners of the government; I should have made, in short, a work which would have cost me leſs trouble, and would have been more pleasing to the generality of my readers: but, recollecting that I was working for your excellency, already versed in the language and history of China, and that I had promised to send you the will of Kang-Hy, not a work of my own invention, and that naturally you would have greater pleasure and feel more interest in hearing Kang-Hy speak himself, than in reading the most laboured of my writings, I did not hesitate to sacrifice my own taste to that of your excellency; I reckoned as nothing the numerous difficulties which I met with at every page, and I have made it as literal a translation as it was poſsible for me to do.

Your excellency will, therefore, see quite naked the whole mind of Kang-Hy in his last moments. You will follow every step of it, in its character and dispositions; and you will see the very bottom of his heart. I am bold enough to add, that you must admire him.

Your excellency, however, must not expect to find in the will of Kang-Hy such curious and interesting facts, such negociations and intrigues, and such refinements of politics as are found in the testaments of the Abberoni's and Richlieu. China, being an insulated empire, has not any connexions with foreign powers, and only sees small states on its borders who are all eager and interested in paying her tribute; and whose policy is solely confined to the preserving of order and peace in the interior of its provinces, by keeping the people in a certain comfortable and easy situation. The result of this is, that its sovereigns are never acquainted with, and never can know, those intrigues of jealousy and ambition, that rivality of interests, and those shocks of contending parties, which agitate the courts of Europe.

Kang-Hy, in the first year of his reign, was, it is true, a politic, warlike, and conquering prince; but his politics and his conquests never extended beyond his own states. The instant he had pacified them, his ambition was satisfied; and, without troubling his mind with what was pafsing elsewhere, all his thoughts were occupied in protecting his vafsals, in keeping his people to their duty, in strengthening the powers of his dynasty, and in living in the midst of his subjects tranquil and happy.

The only thing that affected him during his whole reign was also the sole subject which employed his last moments. His testament, like a faithful mirror of his heart and mind, is but a suite of reflections dictated by his profound respect to heaven, by his indefatigable attention to the affairs of state, by his constant love of justice, and by his paternal tenderneſs for his august family; pacific virtues, the happy junction of which have made him the greatest prince that ever governed China.

I dare not pronounce on the end which Kang-Hy had proposed to himself in writing this testament; but I cannot help thinking, and perhaps your excellency will agree with me, that his chief object has been to justify his dynasty for the manner in which it seized the empire, and to gain to it, for ever, the love and esteem of the nation.

This, according to my idea, accounts for all those historical facts by which he recalls to the Chinese their disorders and misfortunes in former times; this animated picture of the pains and labours which his august father suffered in order to restore peace and abundance among them; this strongly-marked contrast between his dynasty and that of the Hans, and Mings; these eulogiums of his own valour, his moderation, his economy, and his equity, virtues which not solely shine in him, but whose brilliancy sheds a splendour on his royal line. What still strengthens my idea is, that exceſsive fear which the emperors of China have of being marked in history, and their singular paſsion to obtain for themselves and their ancestors an honourable place; paſsions which are inspired and com-

manded by that filial piety, which is the first virtue of the nation.

The testament of Kang-Hy, considered in this point of view, becomes more intelligible, and more interesting; and one is not surprised to see this great potentate enter into the detail of all his actions in order to increase the merit of them in the eyes of his subjects.

Under whatever aspect this fruit of my labours shall present itself to your excellency, I beg you will recollect that it is a foreign fruit, and that in this quality it deserves some attention. In offering it, I merely follow the impulses of esteem, gratitude, and friendship, with which the excellent qualities of your mind and heart have inspired me. My wishes will have been amply gratified if, in those moments of leisure which the important affairs intrusted to your intelligence and activity shall leave to you, you will condescend to cast a favourable eye on it. I have the honour to remain, &c. &c.

JOSEPH DE GRAMMONT,
Apostolical minister.

The testament of Kang-Hy, Emperor of China, &c.

FROM the foundation of the empire to the reign of the present dynasty, there is not one emperor who has not made it his law to respect heaven, and to imitate the conduct of his ancestors.

According to this law, which is the basis of every good government, the principal duties of an emperor are, to preserve order, peace, and abundance, in the

empire; to watch inceſsantly, that his subjects engage in nothing which may trouble their happineſs and tranquillity; to treat foreigners with kindneſs; to maintain a reciprocal commerce with other nations, and enjoy mutually with them the riches contained in the four seas. Happy the prince who makes these sacred duties the inviolable rule of his conduct.

As for me, who am now arrived at the ninetieth year of my age, and the sixty-first of my reign, it has not been owing to my weak virtues that I have so long lived and reigned; I owe this double privilege solely to the protection of heaven and earth, to the favour of that spirit which presides over every generation, and to the very great merit of my ancestors.

I have attentively read the history of the monarchy from the reign of Hoang-ty, its founder, to this present day; it includes a period of four thousand three hundred and fifty years: of the three hundred and one emperors who have occupied the throne during these forty-three ages, there is not one who has governed the empire for so long a period as I have done. I never expected to have seen such length of days; when I was twenty years old, I did not think I should ever see thirty; and never dared to flatter myself I should arrive at forty. What a distinction! What favour has heaven conferred on me, that I should reign sixty-one years!

We read in the sacred book Chu-King, that a long life, riches, strength of body united with tranquillity of mind, the love of virtue, and a happy death at an advanced age, are the principal sources from which man derives his happineſs. From hence it may be

inferred, that few men are perfectly happy; for it is very rare that this last source of happineſs is united with the four first. I am ignorant, and cannot foresee when my days may end; but at the great age I am now of, I consider myself arrived at the summit of happineſs. Master of a great empire, I poſseſs all that is contained within the four seas which surround China; head of a family, my sons and grandsons, who amount to one hundred and fifty, aſsure to me a long and brilliant posterity; add to which, there are no longer any wars or troubles in my dominions: from one end of the empire to the other my faithful and obedient subjects enjoy the most profound peace.

When I reflect on the events of my reign, I foresee nothing which can alter its tranquillity; and if I were at this moment to terminate my career, my heart would be in the most perfect repose. No one is ignorant what cabals, factions, intrigues, and pillaging, were devouring and troubling my dominions when heaven chose me to govern them. I dare not attribute to myself those singular events which fortunately changed the face of affairs, and strengthened me on the then tottering throne; but I cannot see without the most heartfelt satisfaction, that order, peace, abundance, and subordination, which now subsist in the whole extent of my vast states.

This glorious revolution, I must own, has cost me immense pains and labour. In imitation of the emperors of the three first dynasties, I have had my eyes constantly fixed on the four quarters of my empire. The factions and revolts which were every where springing up, tore my heart, occupied my whole

thoughts, and flung me at every instant into such dreadful uneasineſs, that I had no more sleep in the night than in the day. What reverses of fortune had I not to undergo, what pains to suffer, what obstacles of every sort to surmount!

When I recall to my mind all the embarraſsments and bodily pains that I underwent, I am no longer surprised that the emperors of the preceding dynasties have not longer reigned. No, it is not intemperance and voluptuousneſs which have destroyed them, as some inconsiderate historians pretend, even when they are pleased to censure the most irreproachable emperors; no, it is not, I repeat it, intemperance and pleasure which have shortened their days; it is the enormous weight of affairs; it is the uninterrupted chain of the cares and embarraſsments of government which have hastened the end of their reign; they have sunk under the weight of government, like to Tehu-Ke-Leang, who finished his glorious career worn out with fatigues and labour. Oh how few ministers of state there are who are emulous to imitate the conduct of that great man!

A minister takes the management of affairs, and abandons it when he pleases; the link which attaches him to the prince only retains him as long as he feels any zeal for his service; the instant that he is disgusted, he throws up his employment, retires from the court, and returns into the bosom of his family, where, free from all care and solicitude, he has the consolation to embrace his children and grand-children; and, after an easy and agreeable life, he views with a tranquil eye his last moments approach.

inferred, that few men are perfectly happy; for it is very rare that this last source of happineſs is united with the four first. I am ignorant, and cannot foresee when my days may end; but at the great age I am now of, I consider myself arrived at the summit of happineſs. Master of a great empire, I poſſeſs all that is contained within the four seas which surround China; head of a family, my sons and grandsons, who amount to one hundred and fifty, aſsure to me a long and brilliant posterity; add to which, there are no longer any wars or troubles in my dominions: from one end of the empire to the other my faithful and obedient subjects enjoy the most profound peace.

When I reflect on the events of my reign, I foresee nothing which can alter its tranquillity; and if I were at this moment to terminate my career, my heart would be in the most perfect repose. No one is ignorant what cabals, factions, intrigues, and pillaging, were devouring and troubling my dominions when heaven chose me to govern them. I dare not attribute to myself those singular events which fortunately changed the face of affairs, and strengthened me on the then tottering throne; but I cannot see without the most heartfelt satisfaction, that order, peace, abundance, and subordination, which now subsist in the whole extent of my vast states.

This glorious revolution, I must own, has cost me immense pains and labour. In imitation of the emperors of the three first dynasties, I have had my eyes constantly fixed on the four quarters of my empire. The factions and revolts which were every where springing up, tore my heart, occupied my whole

thoughts, and flung me at every instant into such dreadful uneasineſs, that I had no more sleep in the night than in the day. What reverses of fortune had I not to undergo, what pains to suffer, what obstacles of every sort to surmount!

When I recall to my mind all the embarraſsments and bodily pains that I underwent, I am no longer surprised that the emperors of the preceding dynasties have not longer reigned. No, it is not intemperance and voluptuousneſs which have destroyed them, as some inconsiderate historians pretend, even when they are pleased to censure the most irreproachable emperors; no, it is not, I repeat it, intemperance and pleasure which have shortened their days; it is the enormous weight of affairs; it is the uninterrupted chain of the cares and embarraſsments of government which have hastened the end of their reign; they have sunk under the weight of government, like to Tehu-Ke-Leang, who finished his glorious career worn out with fatigues and labour. Oh how few ministers of state there are who are emulous to imitate the conduct of that great man!

A minister takes the management of affairs, and abandons it when he pleases; the link which attaches him to the prince only retains him as long as he feels any zeal for his service; the instant that he is disgusted, he throws up his employment, retires from the court, and returns into the bosom of his family, where, free from all care and solicitude, he has the consolation to embrace his children and grand-children; and, after an easy and agreeable life, he views with a tranquil eye his last moments approach.

But how different is the lot of an emperor! the instant he has taken the helm of affairs, whatever his conduct may be, he is not permitted to give them up to foreign hands; his whole life is but a tiſsue of pains, uneasineſs, and fatigue. Read but the histories of Chun, and of Yu; with admiration it will be seen that these two emperors have never for an instant abandoned the reins of government; that they personally entered into all the affairs of their subjects; that they only existed for them; and that each of them died worn out with labour and fatigue at a distance from the court, and from their own families; one at Zsan-on, and the other at Hoci-Ki-Kien. Read the Y-King, that sacred book, where good and evil, vice and virtue, are exposed without disguise, and painted with their own proper colours. You will not see in it one single word of reproach on the conduct of emperors. In truth, to live always in a state of uneasineſs, not to have one single place of repose, to wear out the strength to exhaustion, this is the lot of an emperor. But I am bold enough to say, that among all those who have with wisdom governed the state, you will not find any one whose reign has been so much agitated as mine has been.

Neither jealousy, the love of fame, nor ambition, have placed my family on the Chinese throne. After the misunderstanding between the dynasty of Ming and mine had taken place, my father was justified in declaring war against it; and the troubles which at that time desolated China made the conquest of it easy to him: it was even the advice of his ministers and the generals of his army, that he ought not to lose so

fair an opportunity of making himself feared and respected by his neighbours. Reflecting, however, that it would be acting contrary to the orders of heaven, to seize an empire from a dynasty which had lawfully poſseſsed it for three centuries, he resisted all their solicitations, and never could resolve to follow such violent measures. The troubles were, notwithstanding this, daily increasing in the empire. L'Y-Tching was master of Pekin; the emperor Tsong-Tching had hanged himself in despair. The whole empire, in alarm and consternation, turned its eyes on my father, and implored his succour against the tyranny of an usurper. Affected by the misery of this nation, which was now at its height, he complied with its wishes. He entered China, exterminated the rebel and his whole faction, and was saluted and acknowledged emperor by the acclamations of the nobles and the people.

His first care was, to pay the tribute of esteem and respect to the emperor Tsong-Tching, by ordering him all the funereal honours due to his dignity, and conformable to the ceremonial of the empire.

If we ascend to the preceding dynasties, we shall find, that Han-Kao-Tson, founder of the dynasty of Han, was but a simple commiſsary over part of the town: that Ming-tai-Tson, founder of the dynasty of Ming, had lived in the capacity of servant in a monastery of Bonzes: that toward the end of the dynasty of Y-ven, the general Tching-Yen-Leang, at the head of a considerable army, had succeeded to the empire, which was very soon torn from him by the founder of the Mings.

My family descends from the kings of eastern Tar-

tary; it has taken poſseſsion of the empire through the particular favour of heaven, and with the consent of the nation.

In times of trouble and anarchy, when the whole state is in confusion, he who by his wisdom, his authority, or superior talents, succeeds in restoring order and peace, always becomes the master and legitimate poſseſsor of that state; this is an historical fact. No one can by his own personal force gain the sovereign authority; for it is heaven who disposes of scepters and crowns. He, on whom its choice falls, has nothing to dread from man; if heaven has destined him to enjoy a long and pacific reign, all the powers of the world can neither trouble nor shorten its course.

From my earliest infancy I have studied the doctrines of the ancients and moderns; and I am not ignorant of any thing that they have taught either curious or useful on every subject. When in the vigour of my age, I could bend a bow of a hundred and fifty pounds weight, and shoot an arrow of the greatest length. The conducting of armies, and forming of sieges, as well as the giving of battle, are acts of which I am perfectly master.

Notwithstanding my being so completely skilled in the art of war, however, and although I have been brought up, and educated amid the tumults of war, no one can ever reproach me with having violated the rights of justice or humanity. In my whole life I have never put any man unjustly to death. If I have caused the death of the three kings, and exterminated the family Mo-pe, I owed their death and punishment to the security of the state.

With regard to the imperial treasury, I have always considered it as the blood and sweat of the people. I have therefore, in consequence, never made any use of it, but for the support of armies in times of war, and for the subsistence of the people in times of famine; I have never made the least superfluous or useleſs expenditure of it.

Let any one enter the different palaces wherein I lodge during my journies; they will not find any thing precious within them, nothing extravagant either in the furniture or ornaments. Ten or twenty thousand taels are sufficient for the keeping up each of these palaces every year. The repairs of the dykes cost the state annually upwards of three millions of taels; so that for the maintenance of all my palaces, there is not more expended than the hundredth part of what the dykes cost.

Have I not reason, therefore, to be satisfied with the judgment which posterity will paſs on me?

In former times Leang-ou-Ty took poſseſsion of the throne by his courage and valour. When he was eighty years of age he was dethroned by Hen-King, his vaſsal, who had him shut up within four walls to perish with hunger. The emperor Soui-ven-Ty succeeded also to the empire without the smallest resistance; and, through a singular act of weakneſs on the part of Tchong-Tching-Kung, he did not foresee that his son Yang-Ty would deprive him of the crown and of his life.

These two emperors ought to have taken early precautions against the ambition and wickedneſs of scoun-

drels. An attentive eye discovers at a distance the most secret plots.

As for myself, I know my subjects, and that they are very affectionate to me. Among the princes, the nobles, the ministers, and the mandarins, among the soldiers and the people, even among the mongol princes, there is not one who is not interested about me, who does not wish me well, and who does not most sincerely desire the prolongation of my life and reign.

Old as I am, and touching as I do the extremity of my life, I feel, however, that my heart and mind are in a perfect repose; I am even sensible of a sweet consolation when I think that the sons and grand-sons of the princes L'Y-Tsing-Vang, and Sao-Yu-Vang, my uncles, are still full of health and life.

You, who all compose my family, do not afflict yourselves at my departure! provided you live long, and in perfect harmony, I am contented, and I die with pleasure.

Yong-Tsing-Vang, my fourth son, resembles me in many points. He poſseſses all the talents neceſsary to govern the state; and I order him, after my decease, to take poſseſsion of the empire. Let the mourning of twenty-seven days be kept according to custom and the rules prescribed; and let this my last will be published at court, and in the provinces.

To the Editor of Recreations in Agriculture, &c.

SIR, West Canal, Oct. 28, 1801, near Sherbone, Dorset.

As a warm admirer of all your useful publications and principles, may I humbly ask pardon for diverting your mind from subjects of greater importance, and request the favour of you to inform me, whether the cattle in the eastern counties with lumps on their shoulders, called by different names, are of the same species with ours, capable of producing in mixture an intermediate prolific new branch for future generations? Having some young cattle got, by an Indian bull of the zebu kind, from Devonshire and Jersey cows, which I am much pleased with for their energy and beauty, very small bone, soft hair, and fine early ripening quality of flesh, and for their hardineſs; but I have been given to understand lately, to my great mortification, that they are barren mules. In the Middlesex Report there is mention made of a cow bred in this way by the late John Hunter (the great naturalist), that was excellent for milk, which rather surprised me, and which is the only instance that I have ever met with to prove that I am right. I have been engaged for several years in experiments of this kind, and have always found nature well pleased with variety, and the English cattle and sheep (as well as horses and pigs) in the highest state of improvement, when they have been warmed, steeled, and regenerated with due portions of foreign blood. Croſsing the English Channel, therefore, to ameliorate and invigorate the useful animals, I am sure is right; as far, at least, as our own islands of Jersey, Guernsey, and Alderney, France, Spain, Corsica, &c. and the

drels. An attentive eye discovers at a distance the most secret plots.

As for myself, I know my subjects, and that they are very affectionate to me. Among the princes, the nobles, the ministers, and the mandarins, among the soldiers and the people, even among the mongol princes, there is not one who is not interested about me, who does not wish me well, and who does not most sincerely desire the prolongation of my life and reign.

Old as I am, and touching as I do the extremity of my life, I feel, however, that my heart and mind are in a perfect repose; I am even sensible of a sweet consolation when I think that the sons and grand-sons of the princes L'Y-Tsing-Vang, and Sao-Yu-Vang, my uncles, are still full of health and life.

You, who all compose my family, do not afflict yourselves at my departure! provided you live long, and in perfect harmony, I am contented, and I die with pleasure.

Yong-Tsing-Vang, my fourth son, resembles me in many points. He poſseſses all the talents neceſsary to govern the state; and I order him, after my decease, to take poſseſsion of the empire. Let the mourning of twenty-seven days be kept according to custom and the rules prescribed; and let this my last will be published at court, and in the provinces.

To the Editor of Recreations in Agriculture, &c.

SIR, West Canal, Oct. 28, 1801, near Sherbone, Dorset.

As a warm admirer of all your useful publications and principles, may I humbly ask pardon for diverting your mind from subjects of greater importance, and request the favour of you to inform me, whether the cattle in the eastern counties with lumps on their shoulders, called by different names, are of the same species with ours, capable of producing in mixture an intermediate prolific new branch for future generations? Having some young cattle got, by an Indian bull of the zebu kind, from Devonshire and Jersey cows, which I am much pleased with for their energy and beauty, very small bone, soft hair, and fine early ripening quality of flesh, and for their hardineſs; but I have been given to understand lately, to my great mortification, that they are barren mules. In the Middlesex Report there is mention made of a cow bred in this way by the late John Hunter (the great naturalist), that was excellent for milk, which rather surprised me, and which is the only instance that I have ever met with to prove that I am right. I have been engaged for several years in experiments of this kind, and have always found nature well pleased with variety, and the English cattle and sheep (as well as horses and pigs) in the highest state of improvement, when they have been warmed, steeled, and regenerated with due portions of foreign blood. Croſsing the English Channel, therefore, to ameliorate and invigorate the useful animals, I am sure is right; as far, at least, as our own islands of Jersey, Guernsey, and Alderney, France, Spain, Corsica, &c. and the

Mediterranean sea; but, whether I have not been too bold in leaping the equator, or whether I had not better have stopped and selected my sheep in Spain and at the Alps, and my cattle in Arabia Felix, I am anxious for you to say. Meanwhile I contend, that the very best sheep and cattle in this island, producing beef, mutton, wool, cheese, butter, and suet, worth most by the pound, and in the smallest compass, and with the least offal, are produced (with very few exceptions) in the southern, eastern, and south-western quarters, on chalky, sandy, lime-stone, gravelly, and other mild calcareous warm soils, in the eye of, and under the celestial influence of the parent sun. As then, unfortunately for improvements in live-stock, we are placed a little too far *north*, and at too great a distance from the sun, for producing the sweetest and best cattle and sheep, ought we not to endeavour to correct that sourness in the animals, proceeding from excess of acid in the soil, food, and climate, by calcinations and dressings of calcareous earths, and by blending with foreign breeds, in general as much too light of flesh, as ours are in general too heavy? Upon the same principle as the best English soils, the fat, crumbling loams, and the land of Egypt flowing with milk and honey, is said to be compounded of the lightest, poorest sand, and the stiffest clay happily mixed; upon the same principle would it not be right (if restrictive laws were right) to oblige the tillers of the earth to repair annually to *the salt sea as near the English and Bristol Channels, and as far from the German ocean and North Sea as possible*, for change of seed, with a view of having their corn heavier, cleaner, sooner ripe, and less encumbered with

bran? For where is there a good farmer to be found in England, who is not fond of Devonshire cattle, South-down sheep, Isle of Thanet rathripe barley, Isle of Wight wheat, and Norfolk turnip seed? If, therefore, I am in error, I hope you will have the goodneſs to set me right as a breeder of cattle and grower of corn; which will be ever gratefully acknowledged by, sir, your most respectful and humble servant, JOHN WHITE PARSONS.

I wish it were in my power to give satisfactory answers to Mr. P's doubts and queries; but, that not being the case, I must content myself with subjoining such observations as occur tending to facilitate his laudable pursuits.

No fact has yet fallen under my own observation that can either confirm or refute the opinion that he holds respecting the prolificacy or the reverse of the different varieties of cattle; but from reasoning and analogy I am strongly inclined to believe, that all the kinds of cattle he mentions are only *varieties* of the same species, and that, of course, they will be prolific. The fact he mentions respecting Mr. John Hunter's cow seems to confirm this opinion, and I have been told of others that point the same way. I have also heard it aſserted by some persons, that the progeny is not prolific, but have met with no fact sufficiently authenticated in confirmation of the opinion. This is a point, then, that remains to be elucidated; and I know no one who is in a better situation to do this than Mr. Parsons himself, who has confeſsedly some individuals of this mixed breed: and what should prevent him from trying whether they can be made to

procreate or not? He will perform an acceptable service to the public by trying the experiment. Should it even fail of succeeding to his wish, it does not appear that he can be a loser by it, as, should they miſs having young, they will not thus be injured for feeding.

I beg leave, however, to suggest, that should it so happen, that in his first experiment he should not procure a calf, it *should not* be admitted as an unequivocal proof that they are by nature sterile. The proof of a negative, it is well known, is very difficult. It is well known also, that cows which are prolific sometimes miſs a calf; so that it ought not to be one, but a great many experiments, which should be admitted as nearly conclusive on this side of the question. There are many circumstances that may have influence to frustrate in this case the powers of nature, that do not, however, subdue them. It is in the recollection of every naturalist, that the great Buffon made many unsuccesful attempts to procure a breed between the wolf and the common dog, from which he inferred that these animals were not of the same species; but Mr. John Hunter succeeded in procuring a breed between them, which was found to be a mongrel, and prolific as other mongrels are. It is also a fact equally well known, that though tame elephants have been kept by men for two thousands of years past, it was universally believed that they could not be brought to procreate while in that state; yet it was proved, about ten years ago, that this has been a mistake; and that the opinion has been adopted merely because they never had been placed in circumstances that admitted of it. These furnish sufficient

reasons for being cautious how the negative opinion in this case be adopted, should circumstances seem even to concur in favouring it.

As to the other opinions of this ingenious correspondent, though some of them do not entirely accord with my own, I see no reason why they may not be submitted to the public, with a view to subject them to the test of fair experiment. In regard to some of these particulars, my own opinions are already before the public; and it would be obtrusive in me to re-urge them in this place. In general, I am inclined to think that heaven has been more indulgent to man than we are disposed to admit, by making improvements depend more upon the influence of his judgment and the exertions of his industry, and less upon the over-ruling influence of physical causes, than my correspondent seems willing to admit. But, though we may perhaps differ in some trifling particulars, we both, I presume, agree in wishing to forward all useful improvements to the best of our power. If all other individuals would as heartily concur in their efforts to the same purposes, there can be no doubt that considerable progress would be made. I most sincerely wish Mr. Parsons all manner of success.

ON FEMALE EDUCATION.

[*Continued from page* 154.]

What is the ground-work of Education?

To remedy all these evils, it is of great advantage to be able to commence the education of girls from their earliest infancy: this first age, which is given up

to women, who are not only indiscreet, but often of bad characters, is, however, that in which the most profound impreſsions are made, and which consequently have a great weight on all the remainder of life.

Before children know how to speak, they may be prepared for instruction. I may perhaps be thought to say too much; but one has only to consider what an infant does who cannot yet talk; he is learning a language which he will soon speak more correctly than the learned can speak the dead languages, which they have studied with so much labour in the most mature age. But what is the learning a language? It is not only to store in the memory a great number of words; it is also, says St. Austin, to observe the sense of each word in particular. The child, says he, amidst its cries and plays, remarks of what object each word is the sign; he dôes it as he considers the natural motions of the bodies which touch, or which point to the objects they are talking of, being at times struck with the repetition frequently made of the same word to signify the same object. It is true, the constitution of the brain in children gives them an admirable facility for the impreſsion of all figures; but what attention of mind does it not require to discriminate them, and to attach them severally to its object?

Consider also, that in this age children seek those who flatter them, and avoid those who are any constraint. How well they know how to cry or to be silent, in order to obtain their wish; how much artifice and jealousy have they already acquired. I have seen, says St. Austin, a child jealous; it could not

speak, and yet with inflamed eyes and a pale countenance he eyed the child which was sucking with him.

One may therefore conclude, that children at that age know more than is commonly imagined; you may therefore give them by words, afsisted by gestures, the inclination to be with the decent and virtuous persons they shall see, rather than with others, whom it would be dangerous for them to love. Thus you may, by the different sounds of your voice, and the cast of your features, point out to them with horror those whom they have seen in a paſsion, or acting in any other disgraceful manner; and by speaking in the most gentle tones, and with the serenest countenance, represent to them with admiration what they have seen most amiable and virtuous in the conduct of others.

I do not point out these trifles as great objects, but in order to shew that these distant dispositions are not to be neglected as beginnings, and that this manner of leading children early by insensible means facilitates education.

If this power of early prejudices in children over mankind should be doubted, one has only to observe how much the remembrance of things which have been loved in infancy is still warm and affecting in a more advanced age. If, instead of instilling into children vain fears of phantoms and spirits, which only weaken, by too great shocks, the brain, which is as yet so tender; if, instead of permitting them to follow all the imaginations of their nurses, for those things they ought to love or fly from, pains were taken to impreſs upon them agreeable ideas of good, the con-

trary of evil, such prejudice would in the end greatly facilitate the practice of every virtue: but, on the contrary, they make them fear a priest dreſsed in black; they never talk of death but to frighten them; they tell them that the dead return at night under hideous figures. All this tends to render the mind weak and timid, and to pre-occupy it against better things.

What is most eſsential in infancy is, to be attentive to the health of the child: to endeavour to purify its blood by the choice of aliments, and by a simple and uniform management: it is, to be regular in its repasts, so that it may eat almost always at the same hours, and that it eat sufficiently in proportion to its strength: that it does not eat but at meal times, for it is only overloading the stomach when the digestion is not completed: that it eats nothing highly seasoned, which may induce it to eat more than is neceſsary, and which may disgust it with other food more proper for its health. In short, that not too many things are set before it; for variety of meats, which succeed each other, excite the appetite after the real neceſsity of eating is gone.

It is also very important to allow the organs to gain strength, by not preſsing too much instruction: to avoid every thing which may inflame the paſsions: to accustom the child, by gentle means, to be deprived of such things as it may have expreſsed an ardent desire for, in order that it may never expect to obtain those things it wishes for.

If the child is naturally good, one may thus render it docile, gay, patient, firm, and tranquil; but if this early age be neglected, it becomes ardent and impe-

tuous for its whole life. Its blood becomes heated: habitudes are formed: the body which is yet tender, and the mind which has not taken a bent towards any particular object, turns to evil; then is formed a sort of second original sin, which, when the child grows older, becomes the source of a thousand disorders.

From the moment children advance in age, when their reason begins to shew itself, every word which is spoken to them should serve to make them love truth, and to inspire them with contempt for every kind of dissimulation. Of course, no sort of feint should ever be made use of to appease them, or to persuade them to do what is desired; for by this means you would teach them cunning, which they will never forget. Children must be led by reason as much as possible.

Let us consider more closely the state of children, to see more in detail what is proper for them. The substance of their brain is soft, but it daily hardens: as for their mind, it knows nothing; every thing is new to it. This softness of the brain causes it to receive easily whatever is imprinted on it: surprise and novelty make them easily wonder, and they are very inquisitive. It is true also, that this humidity and this softness of the brain, added to great warmth, gives it a continual and easy motion, whence proceeds that constant agitation of children, who cannot fix their minds on any one object, any more than they can remain quiet in any one place.

On the other hand, children not knowing how to think or act for themselves, observe every thing, and say little, unless they have been indulged in talk-

ing much, which is very necefsary to be guarded against. Very frequently, the pleasure we take in pretty children spoils them, and accustoms them to utter whatever comes into their head, and to talk of things of which they have as yet but very imperfect ideas; hence it happens, that during their whole lives they acquire a habitude of judging very precipitately, and of speaking of things whereof they have not clear ideas; which causes an indifferent sort of understanding. This pleasure which arises from children also produces another pernicious effect; they perceive that they are looked at with satisfaction; that every thing they do is noticed; that they are listened to with pleasure; and hence they accustom themselves to believe that the world will be always occupied about them.

During this age, when every thing is applauded, and no contradiction is felt, chimerical hopes are formed, which prepare infinite disappointments for the rest of their lives. I have seen children who fancied that they were the subjects of conversation every time that people conversed by themselves, because they had observed it had been often so before: they imagined that there was nothing in them but what was extraordinary and admirable. Great care should, indeed, be taken of children, but without suffering them to notice it. Shew them, that it is through friendship, and from the necefsity they are in of having care taken of them, you are attentive to their conduct, and by no means through admiration of their talents. Be contented to form them by degrees, as opportunities may naturally offer; when you might even form the understandings of children without much trouble, you should be cau-

tious of so doing; for the dangers of vanity and presumption are more to be dreaded, than the advantages which may be reaped from these premature educations which make so much noise. Be content to follow and aid nature. Children know little, and should not be excited to talk; but, in consequence of this ignorance, they have many questions to ask. It will be sufficient to give them exact answers, and sometimes to add slight comparisons, to render more striking the intimation given them. If they ever give an opinion without perfectly understanding the subject, you must embarrass them by some new question to make them sensible of their fault, without rudely confounding them: at the same time you should give them to understand, not by indefinite praises, but by some essential mark of your esteem, that you approve of them more when they hesitate and ask concerning what they are ignorant of, than when they determine the best. This is the true way of implanting in their minds, with a great deal of politeness, a real modesty, and a thorough contempt for those disputations which are so common among young persons, even the best informed.

From the instant when their reason has made any progress, the following experiment must be put in force to guard them against presumption. You see, you will say, that you are more reasonable this year than the last; in another year you will perceive things which you are incapable of understanding now. If during last year you had wished to decide on things which you now know, and were then ignorant of, you would have determined wrong. You would have been

blameable to pretend to know what was beyond your reach: it is the same at this day in respect to things which you are yet to learn; and you will one day see how very imperfect your present judgments are. However, put your confidence in the advice of those who judge as you yourself will when you shall have acquired their age and experience.

Curiosity in children naturally foreruns instruction; do not fail, therefore, to take advantage of it. For example, in the country they see a mill, and they want to know what it is; you must then explain to them how the food which nourishes man is prepared. They perceive some reapers; then inform them what they are about, how corn is sown, and how it multiplies in the earth. When in a town they see shops wherein a variety of trades are carried on, and different merchandises are sold; you must never feel importuned by their questions; they are the openings which nature offers for the facilitating of knowledge; but, on the contrary, shew a pleasure in listening to them; by this means you will insensibly teach them how all things of use to man are made, and on which commerce is established. By little and little, without any particular study, they will learn the proper manner of making every thing neceſsary for their use, and the lowest price of each article, which is the real basis of economy. This knowledge, which ought not to be despised by any one, since all have the same need to avoid being deceived in their expences, is more particularly neceſsary for girls.

[*To be continued.*]

Travels of Viator in Scotland.

[*Continued from page* 116.]

OUR traveller, having here determined to depart from the common post-roads of the country, thus explains the motives that induced him to adopt that conduct.

"When I adopted the resolution of making an excursion into Scotland, my object was two-fold: first, to contemplate the scenery of the country in its native wildneſs as much as poſsible; and, secondly, to contemplate the character of its people; to trace, if I could, the effect of local circumstances on the human mind; and to mark, with as much precision as I was able, the effects of the concentration or dispersion of the human species, on the manners, dispositions, and moral character of men; and the tendency that these had to augment or diminish the sum total of domestic happineſs. As I was already in some measure acquainted with human nature as it appears in cities and populous districts, I resolved to direct my views chiefly to those wild and sequestered parts which I expected to find in Scotland, in which, population being thin, I might expect to meet with habits and modes of thinking peculiar to that state of society. To accomplish this, I resolved to pursue a devious course, advancing on turnpike-roads through populous districts with a rapidity similar to that of common travellers; for on such beaten tracts little novelty is to be expected. Inn-keepers are on all frequented roads a set of beings nearly of the same sort, from whom little information is to be obtained, except concerning the

state of the roads, the number of travellers who pafs at that season, and the names of the principal families in the neighbourhood who frequent their houses. Neither was I very solicitous for letters of introduction to men of rank or fortune in the route which I intended to follow; for the manners of persons of that description are so much alike in all parts of the world, that you may become as well acquainted with it in London as in the most remote district in the kingdom. On similar considerations, I was little solicitous about turning aside to view superb houses, or beautiful gardens, or far famed pleasure grounds; for, after having seen half a dozen such places, you find the same devices so often repeated, that one soon begins to ramble over them with a listlefs languor somewhat like that which is felt when listening to the repetition of a tale with which we have been long acquainted, diversified only by some trifling ornaments of style or diction, which only become the more disgusting by the importance which the vanity of the undiscerning narrator affixes to them. For these reasons, I wished to shun the beaten track, and to dive into such sequestered receſses as good fortune should throw in my way. Hitherto, it is true, I have proceeded on this tour nearly as most travellers do; and I have seen only the same objects as thousands have seen before me. But now I have got off the common track, and have resolved to try an exploratory excursion on my own plan. Instead of going by Sterling, or Queen's-ferry, and thus along the great frequented roads to Perth, I am to try to reach that place by traversing those mountains now in my view, and contemplating the

unusual objects that may there present themselves. I shall easily find some tracks pursued by the natives in paſsing from one village to another; and, though I may not meet with elegant inns and well-stored larders, I shall at least find a welcome reception among a simple people, who will, perhaps, think themselves honoured by a visit from a stranger of an appearance somewhat superior to their usual visitors; and the healthy appetite that exercise procures will give a relish to their homely fare. The days are now long, and the nights very short; so that I anticipate much enjoyment, and have nothing to fear."

Fortified by these reflections, our traveller set out to gain a ferry called Higgins-nook, near the termination of the great estuary called the Frith of Forth, traversing in his way the best part of the fertile vale called the Carse. Thence he croſsed to a small place called Alloa, a tolerable sea-port, in which there is a considerable bustle, owing to the abundance of coals in that neighbourhood, and some manufactures that have been there established in consequence of the plenty of that article. He here observed a large park surrounding a castellated tower, that was formerly the seat of the earls of Mar, and now belongs to an heir of that family, who no longer bears the title—it having been forfeited on account of their attachment to the unfortunate family of Stuart. In this park he remarked trees of a larger growth than any that he had hitherto seen in Scotland. This ancient seat is now unluckily in ruins, having been very lately consumed by fire, just after it had undergone very expensive repairs.

This place had few allurements to detain our traveller, who accordingly hastened to leave it. He directed his course along the banks of a beautiful brisk running stream, called here the water of Devon; the word *water* in Scotland, he observes, being usually employed where *river* would be used in England. This fine clear stream, so abounding in trouts that they could be easily seen darting through it in various directions as he moved along its banks, pursues a devious course along a fine valley, bounded on the north by a range of mountains of stupendous height and great beauty, which, circling round, approach the banks of the Forth some miles to the westward of Alloa; the valley forming, from one point of view, as it were a continuation of the Carse of Stirling, but which is separated from it to the eastward by a ridge of hills of smaller elevation, which form the southern boundary of the vale, which gradually contracts in breadth as you recede from the sea; till, after a few miles travelling, the mountains rise very steep from the river, and the flat part of the vale diminishes almost to nothing. This vale, in the language of the country, is called Glen-devon.

Our traveller takes occasion in this place to remark, that most of the names of districts and places in Scotland are derived, as he was informed by a very intelligent person in Edinburgh, from the *Gaelic* language; and that, in this language, the diversity of words denoting peculiarities of local situations is very great; so that a single word very often stands in some sort in the place of a description: *dale* and *glen* are of this sort; the word *dale* being universally applied

to denote a very extensive valley, which is of course occupied by a river of considerable magnitude; and *glen*, a valley of the same sort, but narrower, and more limited in its extent. Hence Tweed-dale, Clyddes-dale, Annan-dale, Tiviot-dale, are the vales or dales, through which the rivers Tweed, Clyde, Annan, and Tiviot, respectively flow; and from the name denote vales of considerable extent, and in general having lefs abrupt and precipitate boundaries, than Glen-devon, Glen-roy, Glen-coe, and others of the same sort." Other words are in like manner appropriated to denote other excavations between hills, and particular forms of hills, which I regret that I cannot particularly specify, farther than *law*, which denotes a conical hill; and *lass*, a steep isolated rock. Indeed I did not at that time pay so much attention to these explanations as I should now do; for my mind was not so strongly impreſsed with a sense of the propriety of it as it now is.

"The hills, on the north side of the vale especially, were finely diversified in form, and covered in general with a sward of green sod, which affords pasturage to numerous flocks of sheep, and some herds of cattle, each of them guarded by a particular attendant followed by his faithful dog; so that it exhibited a scene more truly pastoral than any that I had hitherto beheld. The day too being fine, and my spirits in unison, every thing seemed to harmonise in producing the most perfect concord. The road winded along the edge of the hills, which rose high upon the left hand; on the right, the vale descended with a gentle slope towards the river. This was, in general, corn land, that seemed to promise a rich and abundant

harvest; and, as I approached a village called Dollar, the valley widened a little; the fields appeared to be better cultivated; the houses more neat, and the gardens in nicer order than those which I had before paſsed. In short, the whole scenery in this neighbourhood was so attractive, that, finding a kind of public house near to the church, I resolved here to put up for a short time, to inquire into the causes of the interesting particulars that had presented themselves.

"I inquired for the landlord, whose appearance was plain and homely. His dreſs was very rusticated, his head covered with a flattish kind of cap made of a sort of woollen stuff; this they call a bonnet, and it lay slouching over his face. His hair, lank, and of a sandy colour, was combed careleſsly over his shoulders; his gait was awkward, and his motions slow and clumsy. His addreſs, however, was somewhat better than his exterior at a distance made me expect. When his bonnet was taken off, there was a freshneſs in his cheek, and a vivacity in his eye, that were attractive; and, though his speech was slow, and the sound that he gave to the vowels so very broad, and unlike to those to which I was accustomed, that I had some difficulty in recognising even common words; yet there was a gentleneſs in his manner that indicated an untutored spirit of urbanity; and there was a staidneſs and good sense in all his answers which soon satisfied me that he was a man of sense and sound understanding, from whom I might derive much information; and, upon entering more fully into conversa-

tion, I found that I was not mistaken in these respects.

"I had seen, as I approached the village, a strange-looking kind of house, seated in a very romantic situation, on a rock placed in a cleft between two hills, and was anxious to receive some information respecting it. He told me, that it was the ancient seat of the Argyle family, in which the predeceſsors of the duke of Argyle had resided for many ages, before they removed to Inverary, where they now live; that it was a place often visited by strangers, who never failed to expreſs great satisfaction when they had examined it. This raised my curiosity; and, my landlord having agreed to be my *Cicerone* on this occasion, we sallied forth to examine this singular relic of antiquity.

"After walking about half a mile along the precipitous banks of a small rivulet that ran at a great depth below, whose murmuring noise was heard, though its waters could only at times be seen, we reached Castle Campbell (for so it was, and still is, called). It is built upon a rock that forms a projecting point where two rapid torrents meet, whose waters, descending with impetuous violence down a precipitous slope, have, in the course of many ages, excavated, for the most part through the solid rock, for each a deep bed, forming on either side a horrid chasm of not leſs (to all appearance) than a hundred feet in depth, which must have formed an impenetrable barrier on two sides to any invading foe, and which could not be aſsailed by any weapons that were in use in this island before the invention of fire-arms. There was then no other

mode of attacking this fort, than by going far up the hill, crofsing the rivulets near their source, and then descending between them till you reached it. To defend this side, a deep ditch, the vestiges of which still remain, had been cut quite acrofs the isthmus, which could only be pafsed by means of a draw-bridge. The only flat ground in this place is the small area on which the castle stands, which, with its courts for offices, and crofs ditch, does not appear to exceed on the whole half an acre of ground, the hill rising from thence on all sides being very steep. As the rock on which it stands points directly to the south, it was fully open to the influences of the sun, and sheltered from the biting blasts of the north and east winds; but this, together with the security which it afforded, constituted the whole of the advantages that it pofsefsed; and, when it is contemplated, it gives a strange idea of the comforts of life that these proud chieftains of ancient times enjoyed. I could not perceive the smallest traces of any thing that bore the marks of cultivation, to give indications of a garden of any sort. Tradition reports, that there was a cavity formed under ground, through which they might descend to the river for water without danger of being molested; and there are still the remains of a dungeon, like a deep well with a cover at top, through which prisoners could be let down for many fathoms deep, and thus be secured at a small expence: a fearfully savage invention, which could have been suggested by neceſsity alone, and in which, no doubt, have been perpetrated deeds of the most inhuman barbarity, at the idea of which the mind shrinks back with horror. The pile is now

in ruins; but enough of the walls remains to show what has been the extent and situation of the buildings. After having explored them under the impression of ideas of the most melancholy cast, we left it. On looking back upon it, now in the shade from the descending sun, it appeared a most gloomy mansion; and I thought it might with truth be called the Castle of Dolour, instead of Dollar, which it is now sometimes called from its vicinity to the village of that name.

"To dispel the gloom that hung upon my mind, I requested the landlord to partake of the little repast which they had prepared for me; for I now found him to be an intelligent sensible man, who, under the plainest exterior, concealed many excellent qualities. From him I learned the cause of the superior culture which I had remarked in the fields, and the neatness of the houses and gardens in this village. The family of Argyle, he told me, had agreed some time ago to let out the lands in this neighbourhood in small divisions, by a particular tenure called here a *feu*. The term was new to me; but he found little difficulty in explaining it. From his explanations I could gather, that a *feu* is a kind of perpetual lease, subject to certain casual seignorial acknowledgments at particular occurrences; such as the succession of a new heir, together with a fixed rent-charge payable annually, which is here called a *feu*-duty. This feu-duty is subject to no variation, and is greater or less in proportion to the value of the subject, according to the nature of the original compact. It usually happens, that when the feu is granted, a sum in money is paid

down by the purchaser, and a stipulated rent, or feu-duty, agreed upon at the same time. Sometimes a greater and sometimes a smaller proportion of money is paid down; and, of course, a smaller or larger annual feu-duty is reserved. The parties settle these matters at the time. But, in whatever way this is settled, nothing can affect the security of the tenure, except a failure on the part of the tenant to fulfil his part of the contract by paying the feu-duty regularly. In this way, a person who has got a little money can easily obtain a permanent interest in land, which encourages him to provide conveniencies for himself, and extend the culture of the soil as far as his skill and abilities will permit: and, as this kind of property is transferable at pleasure to another, he knows that it is always in his power to sell it, and thus draw back the full value of his improvements, if ever his circumstances should render it neceſsary. I was delighted with this account; for nothing could appear more just or politic than such an arrangement; and the beneficial effects of it about this place are obvious to the most careleſs observer. In the morning my informer showed me striking proofs of its beneficial tendency in a neat cottage and excellent garden which had been built and cultivated by an industrious tailor, who a few years ago took a *feu* of half an acre of barren heath ground, which is now in a state of great productiveneſs, and in which the man and his family live with comfort. He pays ten shillings a year *feu-duty*; and, had not the ground been thus improved, it never could have been worth six-pence. What a leſson, thought I, should this afford to the people in

England? But it must not be forgotten that both tithes and poor's rates are utterly unknown in this country. This tailor now thinks himself a respectable member of society, and lives in a state of frugality and content, instead of being a burden upon the parish, as he probably would have been had his lot placed him in England. I must observe, that habits of frugality and economy are universal, and strikingly conspicuous in this district. The country people in general are modest and unaſsuming, temperate, sober, and industrious; and better informed, respecting the fundamental principles of morality, than any that I have elsewhere met with. I must try to discover the cause of these peculiarities.

"Early in the morning, my landlord, who had offered to be my guide to a very romantic dell that he described to me as an object well worth seeing, called on me to proceed. I rose with alacrity. The morning was fine; the sun shining out clear, and the dew-drops hanging in numerous clusters from the point of every blade of graſs and every prickle of furze, (a shrub that grows here in great plenty), between the twigs of which were now to be distinctly marked immense numbers of those radiated cobwebs which look like wheels, every filament of which was now thickly studded with very small dew-drops, which did not aſsume the brilliancy of the diamond, but had here more of the appearance of very small pearls. I had often seen these before, but never in such abundance as now.

"Here I had an opportunity of observing the progreſs of nature in one of her most interesting opera-

tions, that of mixing of soils, and forming the substance called mould, or soil. The village lies in the bosom of a recefs formed between two mountains, that is open to the south. The houses stand at the lower part of the hill, close to the place where the acclivity begins suddenly to rise. Before it stretches a valley having a very gentle slope to the south; at the bottom of which, and close by the foot of the hills that form the southern boundary of the vale, runs the river Devon. This valley, it seems to me probable, was at one time a lake. Pofsibly, the river at that time occupied the north part of the valley. The little mountain stream that paſses Castle Campbell, falling here, however, into the valley, coming down from the mountains during every fall of rain in an impetuous torrent, washing down the soft materials of which the surface of the mountains consist, carried them along with the stream in great quantities; which, being suffered to subside when they reached the lake, has gradually filled it up, and pushed the river forward so as to make it occupy its present bed in the opposite side of the vale, where it now runs. By degrees, the earth rose higher than the water in every part of the vale; and, as the torrents still continued at times to sweep along with them a fresh supply of the same materials, the land has risen by degrees in the vale, in proportion as the excavations formed by the torrrents became deeper among the hills, until the surface has aſsumed its present form. It is easy to conceive in what manner, at a former period, when people were few, and no means employed for clearing away obstructions in the course of the rill, it must have been frequently forced

to shift its course, and thus to spread over the whole vale, filling up one place at one time, and another place at a future period, so as to make it rise higher at the northern side next to the outlet of the rill, and thus form a gradual slope towards the river. If this was actually the progress of nature, it must have happened that the weightiest materials carried down by the torrent would take their place nearest the base of the hill, and those of a lighter and finer nature be carried farther down the slope. To ascertain this point, I examined the fields from the road downward to the river, and found it exactly as I had conceived it must be, the upper part of the vale consisting chiefly of an accumulation of large round stones, intermixed with some earth; lower down it consists of gravel, which becomes smaller towards the bottom where it ends in fine silt. I returned along the banks of the rivulet, and there had occasion to observe the changes produced by human industry. Toward the foot of the mountains the bed of the rill was thickly strewed with large stones, among which the water even now, when it is in a very low state, struggles through them with great impetuosity. In floods, very large masses of stone are hurried forward a great way. While these occupy the deep chasm between the hills, no care is taken to remove them; but when the stream enters the level plain, large stones in the bed of the rivulet obstruct its progress, and make it overflow its banks; which proving destructive to the husbandman, care is taken to remove them from its bed as soon as the flood subsides. Hence it is, that the course of the rivulet through the vale is marked by a row of stones,

(at first large, and decreasing in size as it proceeds, till at length they disappear) piled up to some height on either side, which form a sort of rising bank that keeps it within its course; so that, instead of now spreading over the whole of the valley at every inundation, and there depositing its sediment over the whole, that sediment is pushed directly forward by the stream, till it falls into the larger river, by whose current it is swept forward toward the sea, and deposited in corners wherever the rapidity of the current is considerably abated. I felt this a very interesting morning's walk."

ON PEACE.

To the Editor of Recreations in Agriculture, &c.

PEACE is again established; and the affrighted world once more reposes in security. Like a hare that has been hard prefsed by the hounds, just escaped from death, she scarcely yet feels herself secure. Terror and trepidation still predominate; and a long period must elapse before perfect security takes the place of former alarm. The dreadful note of death still sounds in the ear; and from the force of the ideal sensation almost all recollection of the blifsful reality flies away. But the simile cannot be carried further. The poor hare, timid and weak by nature, would gladly rest in her retreat secluded and quiet, did not the never-ceasing hate of her pursuers and enemies force her to fly from her beloved haunts, and seek in remote obscurity the preservation of her life; which, alas! how short a time do all her cares preserve. Not

so the world, which, after a short period of ease, seems tired of the sameneſs of enjoyment that the sweet season of peace affords, and of its own accord rushes headlong, with redoubled fury, into war, and appears to feel its greatest satisfaction in the woes of its inhabitants. The carnage of the bloody field, the groans of the dying, the clashing of arms, the reverberation of ordnance, the loud brasen trumpet, and the hollow drum, constitute its most pleasing recreations. The mad paſsions of the soul, fury, hatred, discord, and revenge, are among its favourites; while the more soft and pleasing emotions of love, friendship, pity, and forgiveneſs, are viewed with contempt and ridicule. But peace is re-established; and adieu for a time to all the fierce paſsions which agitate the mind of man. Let cold-blooded politicians, and nice calculators of the value of lives, consider of its terms, and praise or condemn them as they please: it is sufficient for me that her empire is again triumphant, and I hail her return with more than pilgrim's joy. In viewing the proud trappings of war, his sable and milk-white plumes, his polished armour, and gallant appearance, we forget his terrific nature, his fierce and revengeful spirit; and, until we are taught by fatal experience to appreciate his disposition, we refuse to believe that any evil can lurk under so fair an outside. Like the shining skin and outward form of the Indian tiger, he is beautiful to behold, and pleasant in appearance; but when we look beyond this fine surface we see nothing to admire, but every thing that can create our detestation and abhorrence. The appearance of peace, on the contrary, is always plain; satisfied with the

native serenity displayed in her countenance, and the benignity of her actions, she scorns all meretricious embellishments, and is contented with her own simple but elegant form. The more closely we scrutinise her conduct, and the further we endeavour to penetrate into her thoughts, the more cause we see for admiration, and our hearts are filled with thankfulnefs for her inestimable gifts.

The world consists of many countries; and each person feels himself more interested in the happinefs of that wherein it was his lot to be born than in that of any other. The human mind must ascend from particulars to generals; and he that profefses an equal love for the whole may fairly be concluded to have a particular regard for none. By extending his views too far, and grasping in his imagination universal brotherhood and unity of interests, he weakens his natural attachments; and, not having power to perform his wishes, he loses the opportunity of effecting the good which his finite power enables him to do. The men most famous for this universal paſsion have always either totally neglected their own particular connexions, or in planning schemes for the good of the whole, have overlooked with unconcern, and spoken with perfect calmnefs and apathy of scenes of the utmost wretchednefs and misery, which would fill the minds of others of lefs extended views with horror and amazement. As a great merchant, habituated to immense gains, looks with contempt on lofses that would reduce a smaller trader to ruin; so they, in anticipating the future happinefs of the world, look with unconcern on the revolution of a kingdom. Nothing

is of importance in their minds, so they but see the most distant probability of their wishes being effected; and whether this consummation will arrive at the end of one century, or of many, seems to make no impreſsion upon them.

> For distant good, they present evil brook,
> And in wild plans whole countries o'erlook;
> Their minds for private woes feel no regard,
> To future times they look for all reward.
> Content themselves, good-natur'd souls, to bear all strife,
> So their descendants may have happy life.

Let us then leave to these mighty-minded men the task of effecting their grand projects; and, although we are not uninterested in general happineſs, let us use our more particular endeavours to increase the comfort of our nearer connexions. We must then rejoice at the conclusion of peace, which contributes so much to social comfort, and increases so greatly our power of doing good. No longer does the fond anxious mother listen with apprehension and dismay to the occurrences of the bloody field; nor sicken with the fear of the danger of her children. Again they return to the abodes of their early youth, accompanied by their country's thanks, and loaded with honour and renown. No longer is the country oppreſsed with ruinous taxes; plenty, restored by the goodneſs of providence, the exertions of agriculture gain fresh vigour, and industry spreads her smiles over the whole land. Commerce, no longer afraid to trust her richly-freighted veſsels on the seas, again expands her sails, and with the rapidity of lightning flies over the whole globe, giving and receiving riches. It is through

her means that the useful arts are made known, that the beneficial discoveries of ingenious men are published, new countries explored, and their inhabitants raised from a state of savage brutality to all the delights of social refinement. In her, civilization finds its chief friend; and the first mark of man's regeneration is a desire to become acquainted with her ways. But those are only a few of the blefsings of peace; to enumerate them all is beyond the labour of man. They will be felt by every one; and the disposition of that man who does not see her return with pleasure must be tinctured with the grofsest discontent. S. H.

To the Editor of Recreations in Agriculture, &c.

SIR, November 18, 1801.

I LATELY noticed in the 31st Number of Recreations in Agriculture, &c. your remarks upon a strong philippic, by one of your correspondents from Dublin, against Mr. Perkins and his tractors; but what struck me most therein was, to observe how much your practice was at variance with your precepts. You strongly recommend to all, throughout your works, investigation; and say, that experiments are the source of knowledge, and that knowledge is power. Notwithstanding this, you pafs censure on Mr. Perkins's tractors without even a single trial, in defiance of the united testimony of a great number of respectable witnefses, among whom, if my memory do not deceive me, are not only honourables but right honourables also: but, such is the power of caprice and incredulity over the human mind, that I have seen

men of clear and excellent understanding frequently infected by it. I once knew a gentleman subject to a chronic disorder, who, when much affected, applied to the faculty, and found relief; it happened that the medical afsistant was called to a different part of the kingdom to reside: application was made for the recipé, and obtained: as soon as the composition was known, it lost its credit, on account of its simplicity; nor ever, I believe, was made use of three times afterwards: and I have heard of others that have done the same.

Now read a plain unvarnished tale, on the truth of which you may fully depend. The origin of the tractors was related to a friend of mine (of whom I had it) by a person who had resided in America many years; and who returned to England about four or five years since. A woman in the colony of Mafsachuset, in New England, was much afflicted with a frequent pain in the head. One day she conceived that it might relieve her if she combed her head. By accident, or probably from neceſsity, she made use of a comb formed of iron (an old family relick). As she continued the operation the pain ceased; some days or weeks afterwards, the pain returned; she repeated the experiment, and again found relief. Unable or unwilling to keep so valuable a treasure to herself, she communicated to her neighbours the account of her cure. The wonderful comb was tried by others with equal succeſs; it got celebrated to some distance round her residence. At length the fame of it extended far south, to the place where Mr. Perkins (the father) then dwelt. He, struck with the account, took a

journey to Maſsachuset to know the truth of the report that had reached his ears, and to investigate the nature of the cures. The woman was examined and re-examined by him in every particular. Being fully satisfied of her case, yet unwilling to proceed without a good foundation, he made many experiments with metallic points on the poor in the receptacles for patients in America, and was happy to find many of his trials succeſsful.

Mr. Perkins, who was a man of penetration, saw [or thought he saw] the principle upon which it acted; and he had ingenuity enough to see that it might be turned to his own emolument. He conceived that most external pains arose from obstructions caused by being exposed partially to a draught of cold air, or by damp linen, or being wet with rain; that the electric fire pervades our bodies; that it is the active principle, or principle of action, throughout the universe; that it attaches itself to metals as a conductor from one subject to another, but more especially when pointed; that, by applying these points to the parts of animal bodies under the circumstances of obstructions from the causes before mentioned, a larger portion of electric fire might be brought to the part whereto they were applied, thereby giving an additional warmth, which would remove the obstruction, and so relieve the patient.

A man that could penetrate so justly into the causes and effects of the operations of nature cannot be supposed ignorant of the whim and caprice of the human mind: he was *benevolent*, we must suppose, and wished to benefit his fellow creatures; but he knew that he could not

succeed without making a mystery of it. To cure by making known the plain simple account of cause and effect, he knew was fruitleſs; he was, therefore, determined to benefit mankind *against their inclinations*, by indulging their prejudices with the novelty of a pair of tractors. The case that I before noticed of a gentleman whom I knew, and others of whom I had heard as having no opinion of their medicine when known, plainly evince that Mr. Perkins was not mistaken in his conjectures. He knew that it was neceſsary to amuse, and therefore invented pointed metals of two colours; first using one, then the other, and so on alternately during the operation [as the necromancers of old made use of their mystic signs and circles]. This created a great idea of their efficacy. The people's ignorance of the cause of their pain, and also of the power by which they were relieved, increased their good opinion of them; but what gave the finishing stroke, and stamped their fame, was the five guineas that they paid for them. I have lately heard that Mr. Perkins has now reduced their price to four guineas; for this I am sorry, as they will certainly lose their efficacy in proportion as they decrease in price. I was once in company with several ladies; the tractors were the subject of conversation; I said that I had never seen them. An aged lady immediately produced a pair from her pocket. One, she told me, was silver, the other was gold. She said their power was wonderful; which I soon observed, for it set her tongue a-going, which ceased not for near half an hour, when one observed that she had heard of several persons who had received no benefit from

them. "That was," said the first lady, "because they had no faith." "If faith, Madam," said I, "was the principal agent, the point of a broomstick would cure as well as the tractors:" this put an end at once to the diſsertation; and, as I am now certain that their fame is established, I have no fear that I can prejudice Mr. Perkins; well knowing, that the rich will not suffer themselves to be cured without paying handsomely for it. His humanity, I trust, will not be offended by my recommending to the poor certain tractors from which, in many cases, they may get relief, and enjoy the benefit of Mr. Perkins's penetration, without the expence of his ingenuity.

A gentleman in poſseſsion of a pair of tractors was applying them to his knee when inflamed by the gout, and expatiated much on their influence, by observing, as he drew them over the inflamed part, that the redneſs dispersed, and left a white streak. A young lady, rather an infidel with respect to their exclusive power, begged that she might be permitted to apply the handle of a silver desert spoon; this being granted, the spoon was applied, and the effects were exactly similar, to the astonishment as well as the disappointment of the gentleman.

A lady, under the daily operation of the tractors, mentioned to me their power. I begged that next time she would try a large table fork with a good point; requesting also that the operator would hold it by the metallic part, and not the ivory handle, as I supposed that to be a non conductor: she told me the next day that she thought the effects were exactly similar; she found no difference.

A servant of mine was afflicted with a pain in her face, near her temple. My wife applied the pointed end of a silver tea strainer, drawing it to the bottom of the ear. The pain in the temple was relieved, but it brought a great heat with a redneſs into the ear.

I was one evening with a lady who, while sealing a letter, scalded her finger with the wax, which produced a blister, accompanied with considerable pain. I tractored her finger with the point of a pair of steel snuffers for about ten or fifteen minutes, when she told me that the pain was removed: about three weeks after, I asked her seriously, whether she thought the operation was really of service to her; she answered, "Most aſsuredly;" she felt no pain afterwards, and the bladder dispersed the next day; but a few days afterwards she scalded her finger again in the same manner; and, applying nothing to it, she was troubled with it for near a week.

The foregoing, Mr. Editor, are plain matters of fact; and I hope you will add your testimony to one more; which is, that I have cured you of your incredulity.

X. V.

ON RAISING POTATOES FROM SPRITS.

To the Editor of Recreations in Agriculture, &c.

DEAR DOCTOR, Mayfield, Nov. 18, 1801.

In a letter which I wrote you in the spring (see page 57, in No. I. of your second series) I promised to communicate the result of my observations upon the production of potatoes from sprits, or without the consumption of any valuable

part of the roots; and, had my leisure during the summer been equal to my inclinations, I should have now given you the result of my *own* experiments with the precision I then promised. I am, however, able to shew by the following facts, that either sprits or eyes, taken from the potatoe, will produce as good crops as setts prepared in the usual mode of culture in this country.

My own general crop of potatoes was this year very indifferent, owing to the use of too much dung; so that I had an unusual quantity of haulm, with a very moderate crop under ground, but I could perceive no difference betwixt that from the sprits and setts. The produce from a rood of each were laid aside to have been weighed; but, during my absence, they were earthed without its having been attended to. I could not perceive by the eye any difference in the two heaps as they lay near each other. The following experiment made by a friend, upon whose accuracy the utmost reliance may be placed, ascertains the very important fact of their comparative produce; and here it may be proper to observe, that he used sprits of considerable length, placing them horizontally in trenches, which I likewise tried this season with similar succefs. The following is an extract from his letter upon the subject. "The small attempts I have "made to ascertain the productive powers of simple "sprits in comparison with larger portions of the po-"tatoe, have completely convinced me that there is "no neceſsity to sacrifice any useful part of it in "setts.

"On the 12th of April last, I planted 11 ounces

"of sprits *cut* from the body of the root (only taking "the bare peel); by way of being sure I did not in- "jure the roots, which always strike from the eye at "the time the sprit shoots; these I stopped after the "third joint, and planted horizontally in trenches, "earthing them up afterwards as we do celery, as the "upright shoots which came from every joint ad- "vanced in growth. On the same day I planted "6½lbs. of setts cut in the common way, *taking care* "*that there were the same number of eyes in the* "*trenches containing setts, as there were joints in* "*those where simple sprits were planted,* and that "after planting they were treated exactly alike. I "have now had the whole taken up agreeable to your "wish, and find that the 11 ounces of sprits (which "would have been of no use for any other purpose) "have produced 60lbs. 8 oz. of good sizeable potatoes, "and that 6½lbs. of setts have given 52lbs. 12 oz. You "may rely upon the accuracy of the above state- "ment."

I do not know how an experiment could be conducted more fairly than the above, which terminates even in favour of sprits from an equal number of eyes in setts opposed to them; accident may have occasioned this superiority; but of a regular equality, cæteris paribus, I entertain no doubt.

Mentioning this subject a few days ago at a friend's house in the neighbourhood, he informed me that, during the last spring, he caused a quantity of eyes to be cut out from some favourite potatoes, without at all injuring them, for family use, and that there were as many as about half filled the crown of a man's hat,

or probably about three pints; these were planted, and he shewed me the produce, which was upwards of a load (240lbs.) of some of the best grown and handsome potatoes I ever saw (exclusive of the small ones, which, in this neighbourhood, are selected for hogs or cattle); the weight of these eyes could not exceed 3 or 4lbs. at the utmost, and their value was literally nothing.

I am of opinion that eyes taken out with the point of a knife or an apple-scraper, may, in large practice, be found preferable to sprits, on account of the tenderneſs of the latter; and an apprehension, from their succulence, that in case of long drought the sprits may be injured, and the crop fail. The eyes being carefully dried in an airy situation, may be preserved for several weeks, and on this account merit a preference, though experience has convinced me that sprits may be kept some time either in dry land or old tanners bark, in which I by accident placed a quantity, which I found at the end of a month in perfectly good condition. The eyes, however, require leſs care and attention in the planting; and this is a matter of importance, as all agricultural operations ought to be so simple as to prevent accidents arising from the blunders or inattention of careleſs workmen, from which every one suffers who does not superintend his own affairs in every department.

Your correspondent, in page 158 of the last Number, mentions a humming bird-like insect, which is the *sphinx stellatarum* of Linnæus. Its habits are so similar to those of humming birds, that it has fre-

quently been mistaken for them. Many stories of this kind have been related to me, and perhaps few deceptions have had a better foundation; but I believe as yet no instance can be adduced of a real humming bird having been found in this country, or any part of the north of Europe; though the humming bird-sphinx is tolerably common, but so active as to evade ordinary pursuit without the aid of a net. Its history may be found in most works upon entomology; and figures of it are in Wilks, Harris, Ræsel, &c. Believe me, dear doctor, your faithful and humble servant,

J. LEIGH PHILIPS.

The public are much indebted to my worthy correspondent for his attention to the very interesting object of his inquiries, in whose name I beg leave to return my best thanks; and, though I am satisfied that some circumstance of importance has still escaped notice; yet the appearances are such as will, I hope, induce many others to prosecute these experiments until the facts shall be ascertained beyond a posibility of doubt, and the circumstances that occasion the variations that have been observed accurately pointed out. Many particulars in the above experiments are left indefinite, which ought to be ascertained; with a view to which I shall here specify a few circumstances that ought to be particularly adverted to.

1st. It is a rule that I should suppose without exception, and which has been invariably confirmed by my own experiments, that the smaller the setts of potatoes are, the greater is the proportional return of produce. I should, therefore, expect in all cases a

much greater return from small eyes, or sprits in proportion to the weight of seeds planted, than from pieces of potatoes of a larger size. In this respect the experiment above turns out precisely as I would expect it should do.

2nd. Large setts of potatoes require a certain distance from plant to plant to produce a full crop; if this distance be not allowed, the crop will be diminished much beyond what it naturally ought to be.

3d. I conceive that the only circumstance worthy of being attended to by the cultivator of potatoes is, the *free* produce (that is, the grofs produce, deducting the weight of seed planted) from a given extent of ground; the expence of culture being supposed equal.

The circumstances to be adverted to, then, and particularly noticed, if we wish to give the requisite accuracy to this experiment, are, the number of plants put into the same extent of ground, the weight of the whole sets planted, and the weight of the whole produce in both cases. Unlefs all these circumstances be distinctly specified, I do not see that any conclusions can be drawn of much consequence to the practical farmer; for, so long as these are left indefinite, the result of every experiment may be infinitely diversified.

I do not specify the neceſsity also of having the soil and culture exactly the same in both cases, as this must ever be supposed; but it ought to be particularly specified.

I do not at present wish to enter into the consideration of the conveniencies or inconveniencies that might result from different practices; the physical fact

ought first to be ascertained; this is of importance; and it is only after this is done that the others can be properly considered.

Reading Memorandums.

"GOODNESS is the foundation stone of creation, the inexhaustible source of all felicity. How adorable then is that being who is goodneſs itself; how astonishing his condescension, in uniting in one family all created intelligencies in heaven and on earth."

"The highest degree of perfection to which any created being can arrive must depend on his proximity to the divine character in moral rectitude and goodneſs."

"Lord Kaims observes, that "virtuous actions are found by induction to lead us to imitation by inspiring emotions resembling the paſsions that produce those actions; and hence the advantage of choice books, and choice company."

"The genuine and spontaneous discovery of its own notions is ever agreeable to the human mind."

"M. De Reamour says, that a grain of gold may be extended to 2900 feet, and cover a surface of more than 1400 square inches; and that the thickneſs of the gold in the thinnest parts of some gilt wire did not exceed the fourteen millionth part of an inch."

"I have yet met with very little happineſs from the tender sympathies of relative affection."

"In laying our thoughts before the public, such words should always be chosen as are most strongly and elegantly expreſsive of the intended idea."

"The distempered fancy started at scenes of its own creation."

"The science of physiognomy is neither so fanciful nor irrational as it is generally supposed to be. Every paſsion, every virtue, and their several modes, mixtures, and combinations, which subsist in the human breast, have a correspondent set of muscles in the face; or at least operate differently on the same set of muscles, which, when any affection is master of the temper, are thrown into motion; and this regularly produces a certain configuration of features known by the name of *expression.*"

"It is real humanity and kindneſs to hide strong truths from tender eyes."

"To discover a new uncommon vein of thinking upon ordinary and beaten topics, requires that creative power of imagination which nature has imparted only to her favourites, and with a frugal, sparing hand."

"He was remarkable for having a dark involved countenance, and very mysterious elocution."

To Correspondents.

The Communication from Agricola is unavoidably postponed. It shall appear in our next.

The friendly hint by Mr. Brooke shall be duly attended to. The circumstance he alludes to did not escape the notice of the Editor; but the unavoidable hurry at the end of the month, owing to the delays in the printing, has prevented the possibility of the alteration recommended till this time.

To other Correspondents in our next.

34.

DECEMBER 1801.

RECREATIONS, &c.

N° 4. Second Series, Vol. II.

For Dr. Anderson.

QUERIES RESPECTING THE MANAGEMENT OF A FARM.

SIR,

FROM the general turn of thought displayed in your various publications, I am inclined to hope that you will not be offended at my soliciting your afsistance in regard to a particular that is of considerable importance to me; and therefore I shall proceed without farther apology to state the case to you.

I am about to enter on the occupation of a farm of moderate extent; which I do partly for the purpose of its affording me a pleasing and healthful recreation, as my subsistence does not altogether depend upon it; but, as my finances are not such as to admit of my engaging in this employment without a view to some profit, it is necefsary that I should proceed with caution; and I mean to direct my principal attention to that pursuit. I am already in some measure ac-

quainted with rural affairs; but, from an attentive perusal of your agricultural writings, I feel that my own acquirements in that line are so much inferior to yours, and I have been already so much benefited by your instructions in regard to a variety of particulars, that I am anxious to profit by any hints which you shall be pleased to throw out on the present occasion for my information: nor is it to me alone that these hints may prove useful; for many others, under nearly similar circumstances, may profit by the same; as has, no doubt, been the case with respect to the letter to lord Sommerville on horse-hoeing, which was published in the 11th Number of your "Recreations."

The farm that I am to occupy is situated about twelve miles from a large market town, and is chiefly in grafs at present; but part of it is in corn. It is accounted strong, sound grafs land, though rather tending to over-dampnefs during a rainy season, at which times some coarse sour kinds of grafses make their appearance; and during the whole of the winter season it is soft and spungy. There is not, however, any appearance of permanent springs over the whole; so that during dry weather in summer the land becomes hard, and is apt to chop in the softest places, and dry into a substance somewhat resembling kneaded clay or brick. It is in a middling condition as to richnefs, having been dunged upon the sward as often as circumstances would permit, with dung brought from the town by the back carriage in driving hay. I ought to have stated, that the grafs has been usually cut about Midsummer, and made into hay; the produce, as nearly as I can ascertain, being in general at

the rate of from one load to a load and a half per acre.

The corn land is stiff, and of a thin staple, not being above four inches deep, over a bed of strong brown yellowish clay, which I am told must not be touched by the plough because it will diminish the produce. The crops chiefly cultivated have been wheat and beans, with broad clover and barley occasionally. In a favourable season, especially if it be moderately moist, the crops are tolerable; but in a dry season the earth becomes bound like iron, and the crops are very poor. I am conscious that justice has not been done to these fields by the farmer, and therefore am not without hopes that, by the attention which I mean to bestow upon it, it may be posible to ameliorate it; especially if you shall be so obliging as to favour me with such hints as you shall think necesary to give, with a view to putting me into a right train of management respecting such soils. On my own part I can promise, that every hint which you shall give shall be attended to with the utmost posible precision, and the result of my experience communicated to the public in due time through the channel of your valuable miscellany, should it be so long continued (which I hope and trust it will be) as to render this practicable by, sir, your humble admirer, and sincere well wisher, AGRICOLA.

P. S. I may add, that lime is to be had at a reasonable price about four miles from the premises; but that it never has been employed on these soils as a manure, so far as I can learn. Can you inform me,

whether there is any probability that lime would prove beneficial upon such a soil; and, if so, how should it be applied?

Observations on the means of ameliorating clayey soils, in answer to the above.

There are few cases that could have been propounded which present greater difficulties, if a satisfactory answer be aimed at, than the above. If the land in question belongs to Agricola himself, if it be tythe free, and if he have the command of a reasonable sum of money, it must be his own fault if the enterprise in which he is about to engage do not prove both profitable and pleasing to him; but if it belong to another person, of which his tenure is short or uncertain; if it be liable to pay a tythe in kind, for which a fixed modus cannot be obtained; or if he have not a tolerable sum of money at command, it may be very much the reverse: for, although no land can be more productive than a soil of the nature above described, when it is put into the best order of which it is susceptible, yet while it is in the condition above described its crops are uncertain, and seldom abundant; the expence of management is considerable; and any attempts at partial amelioration will prove both troublesome and fruitless: the money so expended will be lost, and no sensible amendment will ensue. In light soils this is not the case; for, although they are not susceptible of being permanently improved to such an extent, they may, under skilful management, at little expence be ameliorated for a short time to a very considerable degree.

Having made these preliminary observations, which I conceive to be of great importance to all those who are inclined to speculate on agricultural undertakings, I shall, for the satisfaction of my correspondent, suggest a few hints respecting the means of ameliorating clayey soils, which are the result of experience and attentive observation for many years, and may, I think, be relied upon without danger of misleading those who have little experience in agriculture.

There are two maxims respecting such soils which appear to me incontrovertible. The *first* is, that it is scarcely poſsible to cultivate a stiff soil with advantage while it is in a state of poverty; that is, when there is only a thin stratum of vegetable mould above the solid bed of clay; and when that mould has not been so much impregnated with manures, and divided by frequent culture, as to aſsume a friable texture, and luxuriant prolificacy. The *second* is connected with it; viz. that the graſs produced on such a soil, in a similar state of poverty, will not have a tendency to grow finer in pile, or more abundant in quantity, if allowed to lie in that state for ever so many years, but the reverse; as it will naturally run into fog, or coarse and sour graſses, which are disrelished by all domestic animals.

There are other two maxims respecting such soils, which I deem equally unexceptionable; viz. that when such soils are once deepened to a sufficient degree, and ameliorated by proper manures and frequent culture, till the whole of that maſs has become of a moderately friable texture, these soils are capable in the *first* place of being kept under culture for any length

of time with little trouble or expence, and of affording annually the most weighty crops of the best kinds of corn that can be produced in this country; and, in the *second* place, if such soils be properly laid down into grafs, they will be capable of yielding very abundant crops for a great number of years, without any diminution in quantity or in value; and in many cases they will become even more productive and nutritive.

From these fundamental maxims, the truth of which I do not expect that any intelligent practical farmer will controvert, one corollary is so evidently deducible, that he who runs may read. It is, that nothing can be so beneficial to a country, when physically considered, as that of converting such soils from their naturally unproductive condition into their fertile state; because this has a neceſsary tendency greatly to augment the food alike of man and of beast, while it at the same time diminishes the labour and expence of producing it. If so, then it behoves the legislature of every country, and every individual member in that country, to remove, as much as in them lies, every obstruction that stands in the way of such improvement; and to facilitate as much as poſsible the exertions of every individual which are directed to that important end. What these obstructions are will best appear when we have considered what are the means neceſsary to be adopted before the object can be attained.

From the foregoing data it appears incontestably evident, that every person poſseſsing such a soil should apply his whole powers, not to cultivating fields of

great extent in an imperfect manner, but, concentrating his efforts to a small spot only, to manure it in such abundance, and dreſs it so completely, as to put it, *at once*, into that fine order, in which state it is fitted to produce those luxuriant crops of which it is naturally so very susceptible; for, after this is once done, the patch so improved will continue *for ever*, under a course of good management, not only without requiring any aſsistance from without itself to keep it in order; but it will even be capable of affording occasional supplies to bring other poorer fields into a similar state of productiveneſs; thus shall the produce of the land be continually on the increase, while the expence of producing these crops will as neceſsarily be upon the decline.

But the expence that must thus be incurred at once, before the field can be brought into that state of productiveneſs, will be very great. Sometimes it will considerably exceed the whole of the price that the soil in its original state was worth. This expenditure then must be considered in the light of a purchase price, the annual interest only of the money thus expended being expected ever to return to the person who improves it; so that his capital can never be returned to him by the annual produce of the ground. To draw back this capital, if his circumstances shall render that neceſsary, he must sell the land, together with all the emoluments attached to it in consequence of these improvements.

Considering the subject then under this point of view, it will appear that improvements of this sort may be accounted a sort of pro-creation, if the term

be admitted; for it answers precisely the same purpose to the state, that the acquisition of an additional extent of territory would do; with this valuable singularity annexed to it, that this additional territory is accompanied with no expence to the state either for its protection or government; and that, instead of scattering and dispersing the inhabitants, it connects and combines them into a more compact body, which gives additional energy to all their exertions; so that no species of acquisition of territory could be so desirable as this would be.

The above is said on the supposition that the land was originally in a great degree of poverty. In proportion as it is less sterile, the charge of improvement will be diminished. It will sometimes happen, then, that the field will yield more than a bare interest for the money expended upon it; and in that case the capital may be repaid within a limited period of years. Under these circumstances the improvement may not be beyond the reach of a tenant, who shall be insured in the possession of the land for the space of years that are necessary for his indemnification, without being liable to any payment for the improvement that he has made. Hence the necessity is obvious, of a clear and specific lease, liable to no risks or penalties, for a length of time proportioned to the state of the ground, if ever it be expected that any augmentation of territory can be thus made by this description of men.

But if any portion of the produce of that land be abstracted from the improver, his efforts must be retarded in proportion to the proportion of the produce

thus abstracted. In the *first* case above stated, where, according to the supposition, the interest of the purchase can be only annually paid by the increased produce of the land, no abstraction whatever can posibly be made from it, or the undertaking must be for ever frustrated. But if a tenth of the gros produce be demanded, which in general may be reckoned above a fifth of the free produce, it must abstract from the posibility of improvement a prodigious proportion of the land that otherwise might easily have been thus improved. This case applies even to improvements by the land owner; but when it is recollected, that the tythe must bear a still higher proportion in those cases within the reach of the farmer, where the retribution must be made in a smaller number of years; and when we still farther consider, that the general prejudice of the nation has curtailed the duration of a lease in general to one, two, three, or seven years, in most cases; it will be evident, that the desirable acquisition of territory, which is physically within our reach, is thus, from political and moral causes, totally excluded from coming within the compas of our power.

Thus much I thought it necesary to say, by way of explanation of the cautions that I gave to my worthy correspondent in the beginning of this paper. I shall now proceed to the principal subject required to be investigated.

From the above hints Agricola will be able in some measure to judge for himself as to the propriety of his adopting or declining to make the improvements

he proposed; for his farther information a few other particulars shall be added.

It appears to me, from the account he has given of the farm, that so much has been already done to improve these fields as to free him from the most troublesome and expensive part of the operation. It is plain, that the surface-mould both of the arable and pasture fields, has been already so much enriched by manures and culture, as to have attained a very considerable degree of productiveneſs. The defects which he slightly indicates evidently arise from the little depth of the soil, all of which will be entirely removed by increasing the depth of rich friable mould, and nothing else. In its present state, the water which falls from the clouds finds an easy entrance into the rich friable mould at top, through which, in rainy weather, it quickly penetrates; but when it reaches the surface of the solid bed of clay, it can sink downward no farther, but must there spread along the surface of the clay, in whatever direction the ground admits of, until it shall find some outlet through which it can flow off. Under these circumstances the thin stratum of vegetable mould, through which alone the superfluous water can force its way, must quickly be reduced to the state of a pap, so as to encourage the growth of sour graſses and rushes during the continuance of wet weather; which will be greatly augmented by the holes made by the feet of cattle, should they be permitted to run in the field when in this state. From these circumstances, the effects of the manure spread upon the surface of the graſs-land is in a great measure lost, and the produce rendered both sour and scanty. Were

the staple of the soil, or previous mould, however, deepened to a sufficient degree, the case would be greatly changed: the water would continue to sink gradually towards the bottom during the fall of rain, and would not be regorged back upon the mould till it had reached the bottom entirely; which it never could do unleſs when the rain continued without abatement for a very long period of time: and when at last it did reach the bottom, the water would attempt to find its way along the surface of the impervious clay, so that it would be the under part of the vegetable mould alone which at these few times would be softened to a superfluous degree, the surface mould continuing even then in a sound and healthy state: and, as it can only be after a long continuance of rainy weather that even the bottom mould can be moistened too much, and as that undue degree of moisture can continue there but for a very short period of time, it cannot sustain any considerable degree of damage. Indeed, the degree of damage which it sustains, if it does sustain any at all, must in all cases be proportioned to the deepneſs of the soil; for, if that depth be sufficient, the longest continued wet weather that we have, will not be sufficient to make the water reach the bottom of the soil before the rain subsides; or, if it did, the depth would be so far beyond the reach of the principal roots of useful plants, that these roots could never be injured by that moisture.

The above are the phenomena that occur during a continuance of wet weather on such soils. Let us now consider the changes that take place in the drier season of the year in consequence of deepening the soil,

When the soil is shallow above a bottom of firm clay, we have already seen that a moderate shower of rain reduces it to a pap, and that in a short time the water forces its way along the surface-mould till it finds an outlet through which it can flow off in abundance. Under these circumstances, much of the soluble part of the dung is carried off with the rain, so that the soil becomes little benefitted by the manure. The roots, in the mean while, are chilled in the thin pap to which the soil is thus reduced; which being of a small depth, a very short course of dry weather bakes it into a hard cake throughout its whole depth; so that the roots are suddenly enveloped throughout their whole length with a hard dry crust, from which a very imperfect nourishment can be extracted; the plants, therefore, are quickly seen to languish, become pale and sickly, and finally decay. But when pervious mould of a sufficient depth is spread over the clay, the case is wonderfully different. The water, continuing to descend downward during the continuance of rain, only moistens without drenching that mould in which the principal roots are placed; and, instead of carrying off the soluble part of the manure, it only makes that sink a little deeper in the mould, where it is reserved, with the principal part of the water itself, as a store for feeding the plants, and preserving the soft friability of the surface soil during the dry weather that may be expected at certain seasons of the year: for, although the principal roots of grafses run chiefly in the surface mould, yet nature, ever provident for the welfare of all the beings that she hath called into existence, hath ordained, that the roots of

many plants shall descend to a great depth where the soil is sufficiently pervious to admit them to penetrate it; and that if one of these roots shall find suitable moisture, wherever it goes, they shall there imbibe it, and from thence distribute that moisture with a surprising uniformity over all other parts of the plants. These deep roots, then, by descending far below the surface, meet with an abundant moisture long after the thin surface of shallow mould would be totally dried up. This moisture, pumped up by these roots, is distributed by the other surface roots of the same plant through the whole of the soil in which they run, so as to preserve it in that state of moist friability which is the most favourable for the growth of plants, long after the other has been wholly dried up, as may be exemplified by a well known experiment, that of the earth in a common flower-pot being kept in a proper state of moisture throughout its whole depth, merely by keeping a small depth of water in a flat pan, in which the bottom part only of the pot is immersed. To add to the fertility of such soils, it is observable, that the dew which falls upon such moist earth is much more abundant than that which descends upon the dry and parched mould; so that the vegetation continues to go forward with the utmost luxuriance in the one case, long after it has totally ceased in the other. A soil thus circumstanced is fitted alike to resist the hurtful effects of wet or of dry weather.

Such are the causes of that productiveneſs, which is so little affected by the variations of seasons, that is observable on deep, firm, sound, rich loams univer-

sally; for all clays, when sufficiently impregnated with manures, and mellowed by long exposure to the air and culture, afsume the denomination of such loams. It is much to be regretted, that the expence of converting clays into this state is unavoidably so great, as to have induced mankind, in general, to leave that procefs in a great measure to the tardy operations of nature, which, though it operates in these cases very slowly, scarcely ever fails, in procefs of time, to convert a small portion of the surface soil into vegetable mould. Where that stratum of vegetable mould is very thin, the soil is, in the common language of the farmer, denominated poor, or the reverse where it is deeper: and, as some clays are naturally of a more rigid texture than others, and are more slowly affected by aerial influences, the most obdurate in this respect, which in general coincide with the former, are entitled to the same denomination.

Where a farmer undertakes to improve extensive fields of an obdurate soil of the last description, it is indeed a labour of the most Herculean kind; and what no prudent man, who is not the owner of the soil, and pofsefsed of no inconsiderable portion of agricultural skill, with funds sufficient to purchase the fee simple of the ground, will ever attempt to do. Under favourable circumstances in other respects this may, however, be done; but I do not think it neceſsary on the present occasion to enter into this discufsion: it will be enough for me to show by what mode of management clayey soils, which have already got a moderate portion of vegetable mould on their surface,

may be best rendered productive in a short space of time, and with a prudent degree of economy.

The first step, and that which is indispensably necesary, as without it all other efforts will be rendered nugatory, or very unthrifty, is, to deepen the surface of the vegetable mould. The depth of soil at which a skilful farmer would rest satisfied, were things entirely at his command, would not be less than eighteen inches; for no firm loam of less depth can ever be made to yield a series of maximum crops, especially of grass; but in few cases could it be prudent to attempt the deepening it to that degree at once. If the soil be brought to be twelve inches deep, it may be deemed good sound corn-land, that under a proper course of management may yield very abundant crops; but, unless it have this depth, it can scarcely be made to yield a succession of abundant crops of corn, although in particular seasons it may afford sometimes a maximum crop. In no case, however, can it yield abundant corn crops with a rational prospect of success on an average of seasons where the depth of staple is under *eight* inches: I should, therefore, consider it as a maxim never to be departed from, that wherever strong clay soils are to be cultivated at all, the surface mould should be turned up, and completely loosened and enriched, to the depth of eight inches at least, measured in a perpendicular direction from the surface, after the soil has been suffered to consolidate for six months from the time of the last operation. And, if the good mould on the surface did not at the commencement of the operations exceed three or four inches in depth, I should, in general, recommend,

that at the first proceſs it should not be deepened beyond that degree; because the under part of the mould would in that case be put so far beyond the reach of culture and manures, as to render it liable to collapse in a short time into so firm a state, as to be little leſs pervious to moisture than the untouched clay; so that the labour of turning it up would be in a great measure lost, which may easily be obviated by the simple proceſs that follows.

A furrow being first opened to the depth of eight inches, either by a plough or otherwise, let a plough follow, which makes a very wide furrow at the bottom (as is always the case with the Norfolk plough), and which cuts to the depth of four or five inches, and no more: by its operation these four or five inches of the best surface mould will be turned into the bottom of the open furrow: another plough, if the ground be free from stones, should follow in the same track, which should raise up three or four inches of the solid clay, and lay it upon the top of the surface mould, exactly as is performed in the proceſs of trenching in a garden (but if the clay be mixed with stones, which in such a firm mould would interrupt the motion of the plough, this last part of the proceſs may be performed by the spade). By this means, the richest, the most tender and friable part of the mould being turned to the bottom of the furrow, it will not there be in danger of caking too firmly, but will continue still pervious to water, and thus will imbibe the manures that are washed from the surface; and, being easily within the reach of the roots of corn, it will afford them nourishment and support throughout the

whole season, while the more refractory soil upon the top is meliorating by the influence of the air and culture that it receives, conjoined with the operation of the manures that shall be mixed with it.

To accelerate the influence of these operations, the farmer must bestow all his attention and aſsiduity to avail himself of every favourable incident. The first ploughing, if made before winter, while the weather is moderately dry, will be well timed. In that case the water-furrows ought to be laid clear, so as to suffer all superfluous moisture to run off; but if rainy weather should come on, it were better to leave it till the first dry weather in the spring, than plough it up while in a very wet state. In either case the field should be ploughed the second time acroſs as soon as the ground is dry, and the appearance of dry weather set in in the spring; and not before that, should it even be deferred till the month of May or June. But as soon as the weather appears to be favourable, this operation ought to be performed with all the expedition poſsible. Not only should the whole force that the farmer can command of his own be applied with the utmost diligence, and his beasts be double fed, and made to work much beyond the usual working hours, but he should also hire as many ploughs as he can obtain in the vicinity, at any price, in order, if poſsible, to finish this neceſsary operation while the weather continues dry; for, if this can be done, he will derive more benefit from this single operation than from a dozen of ploughings, should a violent rain overtake him before it be finished.

The furrow, at this ploughing, ought not to exceed

five or six inches in depth. When it is finished, if the clay has been of a stiff quality, it will lie in great rough clods over the whole surface. These may be smoothed down a little, by means of a strong harrow drawn over them, as soon as the surface has become a little dry, while they continue still moist within; for in this state they will break into smaller lumps; but this harrowing proceſs need not be long continued; for the clods, as they become dry, will aſsume the hardneſs of stones, on which the harrow can make little impreſsion; unleſs when a slight shower falls, after which the clods will break with ease.

After the field has had this rough dreſsing by the harrow, carts should be instantly employed to lay over the whole surface of the field a complete dreſsing of lime as a manure. This lime should have been previously procured; and, having been brought home in the state of shell lime, should be laid down in heaps in the most convenient place that can be found in the neighbourhood of water. Care should be taken that the lime be not slaked, by rain or otherwise, before it be wanted; for, should this happen, and the lime be run into clods before it be spread, three bushels of such slaked lime will not produce so much effect upon the soil as one would do, if applied in its powdery state. The lime should be slaked just before it is put into the carts, when it is in a light powdery state, and spread out upon the field from the carts while in that powdery state, without being laid down in heaps upon the field; for the clods would not admit of its being taken up and spread equally. This part of the proceſs is troublesome to the men and dangerous to the horses, if due precautions be not used; but it is of too much

importance to allow these considerations to prevent it. The men must be encouraged to proceed with alacrity by some frank and liberal donation, and a more than usual proportion of beer; and the master, or some discriminating afsistant, must constantly attend to see that the horses never be placed to the leeward of the cart either in loading or unloading. The easiest way for both men and horses is, to place the cart, when loading or unloading, so as that the wind blows nearly upon the side of the cart, but with the horse's head always turned a little to the wind for preserving his eyes. His whole body, however, should be covered with a sheet to keep away the dust; and the precautions that I long ago gave in Efsays on Agriculture, Vol. I. page 571, for preventing the horses hoofs and legs from being burned, ought to be carefully attended to.

There is nothing in which I shall more surprise many practical farmers who shall read this, than in the quantity of lime that I shall direct to be employed; for I am well aware that 15 or 16 bushels of lime per acre is reckoned in many parts of the kingdom a full dreſsing at one time. For my own part, I am satisfied, from long experience and observation, that upon soils of the kind of which I now treat, ten or fifteen pinches of snuff would prove nearly equally efficacious. The least quantity of lime that I should think it worth while to apply in the above case would be two hundred bushels per acre; four hundred bushels I should think a tolerable dreſsing; but six hundred much better; and eight hundred better still; especially if the soil were to be deepened at once to a greater degree than has been above specified. The consequence of

such a copious application of lime as is here stated is, that it not only gives a strong stimulus, so as to produce at once a very abundant crop; but it also communicates to the soil a certain degree of mellow friability which renders it pervious to moisture, and easily permeable by the roots of plants that grow in it; and thus gives it at once those valuable qualities which it wanted, and which it could not have acquired, by a leſs liberal procedure, perhaps in the course of several centuries. In consequence of this improved texture, and the qualities that it thus acquires, the effect of every other manure that shall be applied to it is augmented in a ratio beyond any degree that can be estimated. The soil thus also acquires the power of producing many valuable plants which it never could have otherwise nourished: nor does it stand in need of the future application of manures, but at very distant periods of time; and the application of lime in particular, after such an abundant dreſsing, can be dispensed with perhaps for ever. It produces, in short, a permanent amelioration of the soil, which will render it highly productive for ever, if it be continued under a system of ordinary good management.

I am afraid that to many of my readers this disquisition will appear uninteresting; perhaps even some agriculturist may deem it too minute. To no one, however, who is actuated with the genuine spirit of farming, can this be so considered. They know that general directions are of no other use than to conceal ignorance under the cloke of science, and to amuse

the indolent speculator by an idle display of unmeaning words that profit nothing. To a person who is devoid of principle this costs nothing; and a plausible disser-tation on any subject may be written as fast as the pen can trace the characters. This cannot be done with one who puts himself in the place of the owner of a farm, and considers what are the particulars to which he must of necefsity advert, if he hopes to succeed in the enterprise in which he is engaged. Such a one feels that general observations are not wanted; it is the *particulars* only upon which succefs depends, towards which his attention is perpetually directed; and, should any one of these particulars be omitted, supposing the pupil to be unacquainted with the subject, it might subject him to a heavy lofs and serious embarrafsment; and he would have good reason to complain that the writer had misled him by keeping out of view circumstances which, though they may appear to be trifling to inattentive readers, are, to him, of the greatest importance. These are the considerations which induce me, where I attempt to point out the path to another, to enter into particulars with that minute discrimination which I conceive to be absolutely indispensable in cases of this sort: nor should I hold myself guiltlefs if a desire to render writings amusing should supersede any necefsary elucidations. Upon this plan the above has been written; nor shall these rules be departed from in what I shall farther have to add on the amelioration of clayey soils. If this did not appear to myself an object of very great importance, I should not have entered upon it at all; and, having once entered upon the subject, it cannot

properly be abandoned till it be brought to a conclusion. This will not be long in being accomplished; but, should I have reason to think that this will cause any disgust to my general readers, I shall be on my guard against entering upon similar discusions in future.

Travels of Viator in Scotland.

[*Continued from page* 224.]

"ON my return from this agreeable geological excursion," says Viator, "I had the pleasure to find the cloth laid, and breakfast prepared with great neatnes and propriety. My landlord (who had left me some time before, to procure a guide to conduct me through the mountains, where, he said, there being no *made roads*, there was danger of my mistaking one track for another, which might lead me far out of the way before I had a chance of meeting with any person to put me right), now returned, and I with pleasure invited him to partake with me. The tea apparatus was of plain white stone ware; the cream excellent; the butter delicately sweet, having been made that very morning; and, to heighten the whole, I was surprised to see a glas of nice currant jelly, which it is much more customary, I find, to use in this part of the country as a *bonne bouche* at breakfast, than to employ as sweet sauce for venison. There was an appearance of hospitality and kindnes in all this, that was highly flattering to me; as it seemed to indicate the satisfaction which they felt at the attention that I paid to them. The first cup of tea was scarcely poured out, when a

plate of new laid eggs, piping hot, were brought in, nicely covered up in a clean napkin curiously folded; nor do I think I ever ate a more delicate morsel in my life than these afforded. Every thing appeared to me excellent in its kind, and I partook of it with a high degree of relish. My landlord seemed to be much pleased and flattered by the satisfaction that I expreſsed, and was unremitting in his attentions. Some slices of bread had been nicely toasted (dry) for me (for it does not seem that they are in the practice of making buttered toast here); but the landlord himself, with great modesty, declined taking any of it, ordering some oaten cake to be brought for himself; which is the kind of bread, he says, universally used in that country by persons in his station. I tasted it, and found it hard and crisp, of the consistence of hard biscuit, but more crumbly and friable. There was something of an almond-like flavour in it which was agreeable, had it not been accompanied by a kind of pungency that affected the lower part of the palate, which prevented it from being so pleasing to me as it otherwise would have been. Custom had rendered this very peculiarity to him a great delicacy; and he aſsured me that he preferred that kind of cake to wheaten bread. A small bason of milk also was presented, that appeared to be of a kind quite new to me. Its consistence was thicker than any cream that I had ever seen. On inquiring what it was, he told me that it was a peculiar preparation of butter-milk which he could not accurately describe to me; and added, that it was reckoned a great delicacy in that part of the country. It was of a sub-acid taste and pleasing fla-

vour. I was told, that it was usually eaten with sugar, in which way, on trial, I found it most excellent; and, eaten with this milk, the oaten cake tasted much better than the wheaten bread. I now regretted that I had before tasted of so many good things, as I could have enjoyed a full meal of this last as a high luxury. It was impofsible for me, on rising from this rustic breakfast, not to think of the eulogium which Dr. Johnson bestows on this meal in Scotland; the only thing belonging to this country, if I rightly recollect, that he has deigned to honour with his approbation. If breakfast in genteel families as far exceeds ordinary meals, proportioned to their station, as this has done, it must indeed be a very luxurious meal.

"The guide that the landlord had provided was now presented to me, who was, I found, the very identical tailor whose premises had lately so much attracted my attention. He was a cheerful-looking active little fellow, who was prepared to set out with great alacrity on this excursion. To put him into good humour, I desired that he might have any thing he chose which the inn afforded. With a good-humoured hilarity he thanked me, saying, he had breakfasted at home, and stood in no need of any victuals; but on the landlord inviting him to take a glafs out of *his bottle*, which I found was brandy, he cheerfully acceded to the proposal, wishing me good health and a pleasing journey. The landlord then desired him to go forward by himself for several miles, to the place where the *made road* (as he always called the turnpike-road) ended, where he was desired to wait till I should come up, if I did not overtake him before;

the landlord, in the mean while, undertaking to show me the romantic cascades on the river, as he had promised.

"After riding about two miles, we dismounted, sending the horses forward about two miles farther, as we could only see the river properly on foot. The country had now afsumed an appearance very different from what it bore the day before. The river now, instead of running nearly in a level with the banks on each side of it, so as to form a conspicuous object in the scenery, flowed forward in a deep cavity that almost entirely concealed it from notice, except when you was very nearly on its banks. The hills seemed to recede farther from each other on either side; and, as the road had been on the ascent for some time, the scite on which we stood, though elevated considerably above the original valley, seemed to be still a vale, but of much wider extent than before. It was, in fact, an elevated plain surrounded by hills at a considerable distance; but it was a plain undulated by a great diversity of little swells, between each of which was its leſser valley. The farm-houses and cottages of the inhabitants were generally placed on some of these little eminences, near some rill, or living spring of water, having little *yards* as they call them (gardens) to each, which are generally occupied by a small tuft of trees planted careleſsly in the neglected corners. These form a variety of groups that are infinitely diversified; and from their appearing at times, and then being lost behind the knolls as the road rises or falls, the whole, intermingled with occasional groups of cattle, and at times enlivened by the

sprightly appearance of linens bleaching on the sheltered lawn bounded by the limpid rill, formed an ever-varying picture of rural elegance that was infinitely attractive to me.

"We now approached the river, which took a devious course through this undulated vale. As its descent is rapid, it has, during the course of ages, eaten out for itself, as it were, a deep and large excavation, which in some places enlarges to a considerable width, and in others is confined to a narrow chasm, as the materials through which it paſsed were more soft or firm. The rocks here, that are occasionally laid bare, are chiefly of free-stone, through some parts of which a narrow channel is all that the waters have been able to open for themselves. In one place in particular, the rocks above approach so near together at the top, as not to be apparently more than twenty feet apart; but lower down, where the water acts with its greatest force when the river is unusually swelled by rain, the stone has been worn away on each side so as to exhibit something like the base of an arch, the top of which has fallen down. From this rock the water is precipitated in an irregular maſs by one leap to the depth, as I suppose, of nearly thirty feet. The water is projected with great force also through some irregular holes in the rock, that affords a feature highly characteristic of the place. Trees wave their branches in wild luxuriance above the top of the rock, and over the yawning chasm, which gives to it a gloom that is finely contrasted by the white foam of the river dashing among the rocks below. As the rock seems here to terminate by being abruptly discontinued, the looser

earth below has been washed out to a considerable width, forming a sort of amphitheatre of great beauty, surrounded by trees on every side, except on that through which the river (which has now recovered from the perturbation that it bore at its first appearance) spreads forth a wide and placid surface to the sun, and gently steals away.

"From this place we ascended by the side of the river, chiefly within its lofty banks, for near a mile, in which we met with various scenes of singular beauty, which it would be vain to attempt to specify. Never before had I seen a stream that seemed to be so happily adapted as this to the diversion of angling; and my guide assured me, that it is a most excellent trouting river. We were forced, however, at last to ascend to the top of the bank, as no path could be found by the bed of the river; and, having fallen into the track of a road on which we walked for some time, admiring the ever-varying scenery of the country, without thinking of the river, which I imagined had here suddenly altered its course, I found at length that we had approached to its very brink without having perceived it. We were walking along a winding lane through a thick copse of hazel, when my guide, who had directed my attention to some object above, towards which we were walking, gently stopped me, by taking hold of my hand; and, pointing downwards, I saw, through the boughs of hazel and other trees, at a great depth below me, the water in a deep and sluggish stream winding among the rocks in sullen gloom. Dark, even black, it seemed. My head turned giddy; and, although my guide kept me steady by

the hand, I could not think myself secure. We stood upon the very top of a bridge, which the conveniency of the situation had induced the inhabitants of the country, long ago, to build over this narrow chasm. The rocks rose on both sides to nearly the level of the banks, in almost a perpendicular direction. The arch is of stone, the foundations of which, at the height of more than fifty feet above the river as it flowed at this time, rest upon the solid rock. The parapets, which seem to have been originally low, have been suffered to moulder down till they are nearly annihilated; and, the bridge itself being narrow, it appears to be, to any one who has not been accustomed to it, a most tremendous pafs; nor should I be easily prevailed with to pafs it on horseback; though the people in this country, who have been long used to it, ride along here with the greatest coolnefs. Yet I cannot help thinking, that the gentlemen of this district are extremely to blame in not rearing proper parapets here; for, afsuredly, a restive or a skittish horse, by giving a sudden start, might easily precipitate both himself and rider to the bottom on either side in a moment. I believe the pretext under which this neglect is suffered is, that they intend to rear a new bridge here, when this will be all properly secured; but, as it may be a long time before funds can be collected for that purpose, it is certainly neceſsary to secure it in the mean while; which might be done by a simple firm, rough, wooden rail. It is poſsible, however, that this may be neglected until some accident shall remind them of it in a more powerful manner than any hint from such as me can ever do. The force of custom

is here powerfully exemplified; for, although this path must appear terrible to every stranger, yet it is viewed with indifference by those who have opportunities of seeing it frequently.

"About a hundred yards beyond this pafs, which is vulgarly called *The Devil's Bridge*, we found our horses waiting; and here I took leave with regret of my honest landlord, who, seemingly with the most cordial good-will, wished me a prosperous journey, and safe return to my home. The road was here distinct, having two parallel ditches as usual, one on each side, which I could not mistake for any of the natural path-ways in the country. The river, marked by its wooded banks, might at times be recognised to the right; but the eye stretched over it to a great distance, which exhibited a prospect extremely different from any of those that I had been accustomed to contemplate from my infancy; so very different indeed, that it appeared more like a fairy vision than a reality. Through the whole of the country that I had traversed this day the fields are open; scarcely an enclosure to be seen, except the irregular fences round the gardens and corn yards. A great part of this hollow is arable ground; but the corn fields are not closely compacted into one large mafs of open corn-land, as is usual in common-land fields in England. Patches of grafs, of greater or smaller extent, are seen every where interspersed among the corn: nor is the practice of any one person here neceſsarily influenced by that of his neighbour: each farm is poſseſsed in severalty by one tenant. Even the hills are not held in common; they all belong to specific owners, who let them out, in such divisions

as they think fit, to tenants, whose boundaries are distinct, and whose flocks are never suffered to intermix with each other. From this peculiarity of tenure originate many customs which are here observable that must strike the eye of a casual passenger. Amidst the open corn fields you see frequent groups of cattle pasturing quietly, in a situation where you would think there must be great danger of their frequently injuring the crops: each of these herds of cattle is guarded by an attendant, here called a *herd*, who watches over them with care during the day, so as to prevent damage being done by them. He is usually accompanied by one or more little dogs, here called *collies*; a breed of dogs remarkable for their docility, and who, under the direction of the owner, make the cattle do almost whatever they wish for: but as it would be difficult to keep these cattle thus in order, were they to be permitted to stroll at large over the whole field, they are generally kept together in a pretty compact body, so as to exhibit the appearance of picturesque groups, which tends greatly to heighten the beauty of the landscape, and add to its rural simplicity. These *herds*, having also much time on their hands, are induced for the sake of amusement to invent some rude musical instrument for themselves, on which they take great delight to perform some of those simple melodies which have long characterised the music of Scotland. One of the most common of these musical instruments is a plain whistle, in the form of the common flute, to the end of which they affix a small horn, thus fashioning it somewhat after the manner of a trumpet, which tends at the same time

to augment the sound, and render the tones more mellow. This rural flute they call a *stock and horn*; and you can scarcely travel a mile in that country during the summer season without hearing some of the pleasing melodies performed on these rustic flutes, which, under certain circumstances, prove bewitchingly pleasing; and serve strongly to impress on the mind this finest feature of arcadian simplicity.

"The cattle are driven regularly to the fold (a kind of pen) at noon, when the attendant goes home to dinner, or at sun-set when he retires to repose. These folds are a kind of temporary inclosures, made of sod dug up from each side the place on which they stand. They are, in general, of such small dimensions, that 12 or 16 of them will be contained in the compass of an acre: and are built contiguous to each other in a chequered manner. These walls are reared at a very small expence (about a farthing a yard, as I was told) although they are still so firm as to stand for one season without requiring in general to be repaired. This fence is intended not only to secure the cattle while the attendant is absent, but to manure the soil at the same time, the cattle being shifted from one inclosure into another as soon as the first is judged to have received a sufficient portion of manure. Sometimes lime is put upon the field at this time along with the dung. The walls, I was told, are all pulled down about the beginning of winter, and the field is ploughed up, and sown in the spring with oats upon one furrow, which is generally a very abundant crop; the place where the walls stood, even where it has received no dung, being nearly as good as the rest; so

that they think the amelioration of the soil is such as to pay for the expence of rearing the walls. This practice appeared to be in itself so curious, that I was at pains to inform myself very particularly concerning it.

"We overtook our little tailor within something more than a furlong of where he was to have stopped, who seemed to rejoice at our approach; for he had never felt the power of the sensations of the philosopher, who said, that "he never was lefs alone than when alone:" on the contrary, he was never so much pleased as when he was in company where his vivacity was suffered to expand itself with perfect ease in free conversation. I found him to be exactly the person who suited me; as he communicated of his own accord a variety of particulars respecting the manners of the people, and the customs of the country, that might otherwise have totally escaped my observation. The state of his own family, being the subject nearest his heart, came first under view; and it answered my purpose as well as any other could have done; for the circumstances that affected them were nearly the same with those that proved of importance to others around them. The busineſs about which he himself is generally employed is that of a tailor; but, instead of furnishing a suit of clothes to such as want them at a given price, as in the metropolis, he neither furnishes the cloth of which they are to be made, nor any thing else belonging to them, except it be thread and twist, and sometimes buttons of a common sort at so much per dozen. When his aſsistance is wanted, the person who employs him sends for the

tailor to come to his house on a day appointed, in order that he may make some new clothes, or mend such as are worn out. When he goes, the cloth is produced; he takes measure of the person for whom they are intended, cuts out the cloth upon the spot, and then sits down to sew it up *secundum artem*, returning the overplus to the owner, who carefully lays it by for future use. He continues to work in this family till all the work that they have to do in his line be finished. When that is done, he leaves them, and goes to another, where he has probably been engaged for some time, always receiving payment for what he has done before he leaves the family; being paid for his own trouble at the rate of six-pence a day, and four-pence or five-pence for such apprentices as he may have with him at the time, according to the proficiency they have made: this, however, is besides victuals, which are always furnished by the employer. On my expreſsing some degree of surprise at the smallneſs of his earnings, and my wonder how he could have subsisted a family upon it; he laughed, and said he had never felt any difficulty in it till of late, that the price of meal had got so much higher than its usual rate; and he frankly acknowledged, that had he not by the good management of his wife laid up a little *for a sore heel* (a time of distreſs) he should have been somewhat embarraſsed; but as it is, said he, by the aſsistance of my gardens, the good conduct of our little ones, and the bleſsing of Heaven, we have made shift to live comfortably enough. This affords a striking picture of the simplicity of manners, and the primeval mode of thinking, that prevail in this district.

"On inquiry, I found that my guide was blest, as he said, with a family of five children, of whom three are boys, and two girls. The eldest boy, who is now seventeen, has been three years an apprentice to him, and in one other year will be entitled to demand as good wages as himself. "Indeed (says he) at the needle he is now fully as good as myself; but he is not yet quite master of the *cauk* (chalk) and sheers (ſciſsors). The second boy went at the age of *five* to keep two cows for a neighbour; and after two summers he went to a farmer whose cattle he kept three summers; since then, he has been employed at the plough and harrows, and has not cost me six-pence. My youngest boy is now seven; he has kept cattle two summers; and after he has had this winter at school I mean to bind him also an apprentice to myself, to supply his brother's place when he shall be looking out for a wife; then, you know, he must be his own master. My eldest girl, now nineteen, was married last Whitsunday to a smith lad, our next door neighbour, to whom she brought, of her own spinning, six webs of linen, which will make a dozen shirts for her husband, and six pair of sheets; besides three pair of blankets, spun by her mother and her from *thiggings* (loose locks, as I could understand, usual to be given to gratuitous aſsistants at sheep-shearing) of wool in the summer time. She is (said he, with a becoming pride), though I say it, who should not say it, as clever and thrifty a girl as any in the parish; and will make an excellent wife to Tom. The younger girl is at home with her mother, since her sister was married; but till that time she tended a neighbour's cows

in summer by the water side. In short, every one of them brought more wages to us during the summer half year, from the time they were five years old, than was sufficient to get clothes for themselves and pay for their schooling in winter; and the elder now tender me so much of their fee (wages) every half year as puts us out of the fear of want, were we even, through sickneſs, to be laid up for a time. I have no cause for uneasineſs of any sort." Happy, said I to myself, are those who know how to be contented with a little: it is the truest source of independence and domestic peace!

"I give this conversation as nearly as I can in the words of the narrator, because it may serve to exhibit a more lively picture of the *costume* of the country than I could otherwise give; but several particulars hinted at briefly will appear unintelligible to others, as they were to me, till my lively guide explained them to me (when questioned) to the following effect.

"In mentioning prices of provisions, I observed that he took notice of nothing but that of *meal*, and that he neither mentioned bread, nor beef, nor beer. On inquiry I found, that by *meal* he meant chiefly oat-meal; and that this article alone constitutes perhaps three fourths of all the sustenance taken by the people in this part of the country. A preparation of this meal called *porridge* (hasty pudding) made of oatmeal stirred into boiling water, with a little salt, till it be of the consistence of a firm pudding, that is generally eaten with a little milk by way of sauce, constitutes universally the breakfast and the supper of all claſses of persons not exceeding the rank of a farmer.

This is a plain, substantial, nourishing cheap mefs; and is peculiarly favourable to the growth and health of children. Wheaten bread is never seen among that clafs of persons; and meat of any sort but rarely, and in very small quantity. Their bread here is, in general, those thin oaten cakes which I mentioned lately, and some portion of pease bread, which is reckoned nourishing, though not so palatable as the other. For dinner the usual dish is broth, made of pot barley, oat grits (shelled oats), pease or beans, green or dry, cabbages, or other greens, with turnips, carrots, onions, leeks, or other potherbs of the season, stewed all together, with a little salt and other seasoning, with some meat occasionally, though oftener without any. This is of a much thicker consistence than any kind of soups in England, and it is a savoury nourishing mefs. I tasted of some that I was afsured had no meat in it of any sort, and found it very palatable. Bread and milk (sometimes curdled, sometimes plain), cheese, or butter occasionally, with potatoes stewed, very often mashed in milk, are taken in addition to the above; and, as they are never stinted in quantity, these sorts of food are found to enable the labouring people to sustain any kind of fatigue that rural operations require. At hay-time and harvest, they are indulged with a little beer; but at other seasons the usual beverage is whey or butter milk, which is usually distributed by the farmers with a liberal hand to the families of the cottagers who belong to them. No pigs are here kept on the dairy wash.

"These details, if they shall appear uninteresting to some readers, were far otherwise in my estimation.

Want among the lower classes of the people is perhaps the most grievous political disease that can affect society among men; and want is the inevitable concomitant of extravagance and waste among them. Whatever introduces a taste for foreign luxuries, or high priced viands, among the lower ranks of people, throws them instantly into embarrasments which are productive of a long accumulation of evils. It relaxes the energy of the mind, destroys the ennobling principle of independence, weakens the spirit of industry, enfeebles the rising generation by depriving the parents of the means of furnishing their progeny with an abundance of wholesome food; this makes them greedy and gluttonous when occasions offer, and little delicate as to the means of procuring gratifications. The moral principle itself is corrupted, and human nature debased by the habits that it engenders. What then, I would fain ask, can be of so much consequence to society, as cherishing those habits of simplicity, especially in regard to food, which naturally ensures plenty and content among those classes of people which never can enjoy either plenty or content where that simplicity of taste are banished? Let those who theorise upon these subjects, when they are led to draw any other conclusion, come into such a country as that which now surrounds me, and they will meet with facts that will speak a much more convincing language than any words could do."

I have given the whole that occurs in the present Number in the author's own words, without attempting to abridge them in the smallest degree; and shall

be extremely sorry should my readers think that I have erred in this respect.

EXPERIMENTS ON REARING POTATOES.

To Leigh Philips, Esq.

SIR,

As I know you correspond with Dr. Anderson, I have taken the liberty, through your means, to transmit an experiment which I made this year on the productive powers of different kinds of potatoes. I have sent you as many of the names generally used to denote the variety as I know; but as these are arbitrary, I will describe them by the shape and colour of the bulb. They were planted in a rich sandy loam, in high condition, but without any manure at the time of planting.

N. B. There were 27 plants of each, and the sets were planted at 16 inches apart.

No.	Whole potatoes.	Weight planted.		Gross produce.	Net produce.	
		lbs.	*oz.*	*lbs.*	*lbs.*	*oz.*
1.	Bull-nosed kidneys	14.	3.	175.	160.	13
2.	Winter whites	10.	10.	110.	99.	6
3.	Blue kidneys	10.	15.	177.	165.	15
4.	White ditto	11.	4.	122.	110.	12
5.	Irish apple white potatoe	9.	4.	131.	121.	12
6.	Champions	8.		100.	98.	
7.	Ox nobles	8.	4.	188.	179.	12
8.	Fox's seedlings	5.	13.	69.	63.	3
9.	Braughton's dwarfs	5.	2.	66.	60.	14
10.	Mouse kidneys	1.	15¾.	74.	72.	2
11.	Sprits from No. 5	6.	0.	65.	65.	
12.	Eyes from ditto	0.	2¾.	183.	182.	13¼

N. B. No. 1 are pink coloured potatoes, and pro-

duce their bulbs at a distance from the stem, upon a very strong fibrous root.

No. 2 is a round white potatoe, and produces the bulb close to the stem.

No. 3 a long bluish purple potatoe, very white flesh, and good for use in the spring.

No. 4 a long white potatoe, that bears the fruit at a great distance from the stem.

No. 5 a round potatoe, that grows like the Champion; perhaps it may be the same potatoe; I have grown it several years; it is a good produce, and the best *winter* potatoe that I have ever yet met with.

No. 8 an excellent early potatoe, earlier (by at least a fortnight) than any other that I know.

No. 11 I planted double the number of sprits, each about two inches in length, taken from the potatoe, and planted immediately; and when they began to vegetate I destroyed all, except 27 of the strongest.

No. 12 the eyes cut out with a little of the potatoe to each. I did not plant till a fortnight after they had been taken from the potatoe; these and the sprits were taken from the same potatoes, planted in the row marked No. 5.

I shall make some other experiments next year, as I do not choose to depend upon a single experiment. It is a matter of some importance in growing potatoes, not only to ascertain the difference of quantity that each sort produces, but to know the time of the year when each is in the greatest perfection for the public. This I am not at present able to ascertain with accuracy.

To Dr. Anderson.

DEAR SIR, Manchester, Dec. 3, 1801.

The annexed experiments were made by the Rev. George Hulme, of Araley in Worcestershire, and I send them in his own hand-writing, as I consider them not only very accurate but important. As far as *one* set of experiments can be relied upon, they must have great weight. The grofs produce of 183lbs. from $2\frac{3}{4}$ ounces of eyes is very great indeed. You will make any use you please of these experiments; and, as Mr. Hulme is an excellent practical farmer, as well as careful experimentalist, you may have full confidence in the accuracy of his statements.

Yours very truly, J. LEIGH PHILIPS.

Observations suggested by the above.

The ascertaining with accuracy and precision even one single fact in agriculture, I consider to be of greater importance to mankind at large, and to this nation in particular, than the acquisition of a considerable extent of territorial property would be. In the first case, the prosperity of the whole, and the comforts of every individual, would be augmented, without producing inconvenience to any one. In the other case, great expence must be incurred in governing and protecting it; much derangement in the affairs of individuals must neceſsarily be experienced; and many must suffer by this means a deep and lamentable depreſsion, while a few individuals accumulate wealth, and are raised with a destructive facility to a degree of eminence that they had no right to expect;

which tends to promote that extreme inequality of condition that gives rise to discontents which prove the bane of domestic comfort, and occasion a neceſsary train of comcomitant evils, which, but for that circumstance, would never have had an existence. The person, then, who, by well judged experiments, elucidates such facts, deserves to be ranked among the most exalted claſs of the benefactors of mankind. In this point of view the public lie under great obligations to the executor of the above experiments.

It is, however, greatly to be regretted, that the difficulty of ascertaining agricultural facts with accuracy and precision is such, as to render it next to impoſsible for the most diligent experimenter to attain completely almost in any case the point he aims at. The utmost that he can in general expect to do is, to pave the way for some other to follow his track with greater succeſs than he has been able to do, by removing difficulties that have retarded his career and frustrated his best endeavours. The circumstances that may affect the result of an experiment in this line are so numerous, that no person can, *a priori*, advert to them. It is experience alone that can bring them into view; and the experimenter has the mortification too often to find, that where he hoped his efforts were to end, he is only enabled to perceive that he must of neceſsity go over the whole anew before he can derive any eſsential benefit from his labours. This is a prospect so very discouraging to the ardent mind, that it is no wonder if so few shall be found who have the courage to persevere; or that, considering the time that is required for each experiment, the progreſs in this de-

partment of the art should be so slow as to leave us, even at this advanced æra of society, in the dark respecting many of the most important facts in agriculture.

The experiments above narrated, though conducted with care by one who evidently poſsesses great powers of discrimination and accuracy of detail, still leave too much unknown, to permit us to draw any very important conclusions from them; though they will pave the way for other experiments that in time, if prosecuted, may lead towards the point aimed at. When an investigation of this sort is begun, it behoves the inquirer to keep steadily in his view the object that he wishes to elucidate, and to attend, if poſsible, to every circumstance that can affect the result as to that particular only, rejecting all others as merely extraneous. Viewing these experiments in that light, it would seem that the point the inquirer wished to ascertain was, the comparative degree of productiveneſs of the different kinds of potatoes which he subjected to his experiments: and an important point it is. He seems, however, to have been in some measure aware that it has been suspected that a difference in the circumstances of seed planted may affect the crop; or, if it does not, that it may affect the quantity of *free* produce so as to vary the profits that the farmer may derive from following one practice or another. These are two distinct facts; and to ascertain either of them with precision a distinct set of experiments ought to have been instituted. By blending them together in one, the truth of neither can be ascertained.

If any variation in the produce can be effected

merely by a variation in the circumstances respecting the sets, no one can conclude that the productiveneſs of one kind of potatoe can be deemed in general greater than that of another kind, or the *ratio* of that variation ascertained by the quantity of produce yielded in the two cases; because that variation may have been produced by the circumstance affecting the *sets*, the particulars of which are not known. While these circumstances remain unknown then, the only safe course that could be adopted would be to employ *sets* of all the different sorts, that were as much alike in all reſpects as they poſsibly could be made. In one reſpect, the above ingenious inquirer has done this; that is to say, he has employed *whole* potatoes in every instance in the first ten experiments. But this is not enough: the whole potatoes of the same sort may be more or leſs productive, as their bulk is augmented or diminished; and, if so, there has been no care taken to guard against the variation that may be produced by this means. The sets, therefore, should have been all chosen of the same weight at least, if it be meant to show what is the proportional productiveneſs of different kinds of potatoes under the same circumstances. Taking the first ten experiments, it would seem that the potatoe No. 7 yielded the greatest free produce, and the potatoe No. 9 the least, being in the proportion of three to one nearly; and, in as far as *one* experiment can go, this is a most important fact *indicated*, at least, (though by no means ascertained) so as to be sufficient to direct the attention of future experiments to these two kinds. Indications of a similar sort may be drawn from the other numbers of this

experiment; and all these I consider as valuable *hints* that ought not to be overlooked; and therefore I am glad to have it in my power to record, and thus preserve them from being lost: but I am far from saying that implicit reliance ought to be placed upon them.

The experiments No. 11 and 12, when compared with No. 5, are of a different sort; for these three experiments, having been all made with the same kind of potatoe, go to the point of ascertaining whether the produce be influenced by a variation in the circumstances of the *sets*; and, in as far as this experiment goes, it tends to prove, that the produce is affected by this circumstance to a degree much greater than has ever been suspected, and in a manner that has not hitherto been supposed by any one. In as far then as it goes, it totally sets aside every conclusion that can be drawn from the other ten cases. From these experiments it appears, that the same potatoe with the sets prepared in one way gave 183lbs. (the fractions disregarded), by another 122, and by a third 65; so that the free produce from the same potatoe, from the same ground, and under the same culture, may be three times more in one case than the other, merely by a different preparation of the sets. If such a variation can be produced merely by this circumstance, it is certainly a vain attempt to try to ascertain the proportional produce of different sorts by experiment, if the sets be not *in all respects* precisely the same.

My correspondents, however, are both justly aware of the danger of relying on one experiment; and this very experiment adduced sufficiently proves the justness of the remark. It appears by the experiments

recorded in my last Number, that several respectable gentlemen, whose liberality of mind and candour no one will doubt, were satisfied that the produce from *sprits* was equal, if not greater than that from ordinary *sets*. By this experiment it appears, that the produce from sprits was not quite one half of the other; while the produce from eyes only exceeds that from sprits nearly in the proportion of three to one, and more than twice as much as ordinary sets. Although from my own experiments, recorded in Vol. IV, page 251, I have found, that the average produce on two different experiments, from eyes, nearly the same as in the above experiment, when compared with sets of the common size of the same potatoe, was as one to three nearly, and when compared with those from *large* sets as one to *ten* only! What inducements for caution do the above experiments afford? There is no room for suspecting that the smallest intended fallacy in the recording of any of these experiments has been attempted. In the first and the last, an equal degree of accuracy took place in regard to weighing the sets, and the produce. We are only enabled from these facts to conclude with certainty, that the quantity of the produce of potatoes is liable to be affected by so many circumstances that have not hitherto been adverted to, that it is impofsible for us to be too cautious in drawing from a few experiments general conclusions that may be infallibly relied upon as rules of practice: and that, if we ever hope to advance our knowledge in this department, it must be done by accurate experiments often *repeated*, where all the circumstances that are suspected to vary the result in any case are taken

into the account and faithfully minuted. My own experiments, above quoted, were more uniform in their results than any other that I have seen recorded, and therefore I was satisfied at the time that they might be relied upon with tolerable certainty; but many circumstances have since occurred to me, both from my own experience and that of others, which give me reason to suspect, that the peculiarities of different sorts of potatoes are often such as that, though one experiment will give the same result nearly when often repeated with the same kind of potatoe, it will perhaps give a very different—perhaps an opposite result—when another kind of potatoe is employed; so that I think it is neceſsary in all experiments of this sort, not only to record the circumstances that take place respecting it with the utmost poſsible accuracy and fidelity, but also to name and describe (as my respectable correspondent has here done) the particular kind of potatoe which is the subject of the experiment: and, in order that fallacy in this respect may be the more effectually guarded against, I should by no means think it enough that all the potatoes were taken from the same heap, for these are often mixed; and I well know, that two potatoes may be frequently found that could not be distinguished from each other by any eye, which nevertheleſs poſseſs qualities of the most opposite sort; among which variations that of prolificacy is not the least remarkable. In the present state of knowledge then on this subject, I am inclined to think, that no set of experiments on potatoes can be absolutely conclusive, unleſs these are made upon such sets as have all been reared with care from one

parent potatoe; and that even then they must be frequently repeated. Nor can it with certainty be concluded, that what takes place even universally in regard to that kind will take place in respect to other sorts. It can only give indications that ought to be carefully adverted to by every experimenter.

My respected correspondent has marked with a due degree of precision in the above experiments some of the leading peculiarities of the kinds mentioned; such as the form, colour, mode of distending their bulbiferous fibres, kind of taste, and time when they come into good eating. These are all points of much importance to the farmer, and may have an influence on their practice. These particulars, therefore, ought to continue to be adverted to. The size of stem, the manner in which it grows, and the time of its decay, are also particulars that ought to be carefully noted; for these in many cases must have influence on the mode of culture. It were to be wished also, that the kinds which prosper best on clays or on lighter soils could be discriminated with a greater degree of precision than has yet been done; as likewise the kinds that best agree with being planted very early or very late in the season. Many other particulars also deserve notice, which I omit, to avoid exhausting the patience of the reader.

Observations on the different value of money of the same denominations, at different times.

THERE are few things which tend more to mislead the judgment of those who engage in historical disquisitions, than the very different meanings that are indicated by the same words in ancient and in modern times; and in no particular is this more difficult to be obviated, than in what respects monies and coins. For a great many centuries past, the monies of Great Britain have all borne the same denominations as at the present day; and it is natural for a reader, who finds that the price of an article was only one penny, which cannot now be purchased for a shilling, to conclude that these commodities were at that time remarkably cheap, compared to what they now are; without ever considering that many circumstances may have concurred to occasion an *apparent* difference, when in effect no difference does indeed exist.

To render this proposition plain, we have only to observe, that not only in Britain, but in every other nation of Europe, the coin denominated in the language of the country a pound, (livre in France, lira in Italy, pound in England and Scotland,) and were all precisely of one weight, and indicated each a pound of silver of the usual alloy of fineneſs. In this state of purity and equality however, when a nominal pound of money indicated precisely a pound weight of silver, alike in all countries, things did not long remain. The exigencies of government, the bad faith of princes, and other circumstances, induced the rulers of kingdoms universally, some later, and some to a greater degree

than others, first to diminish the real weight of silver in the nominal pound of money, afterwards to augment its alloy, or both; and, this having been repeated at various times, it has so happened, that the nominal pound of money was intrinsically of a very different value at one time from what it was at another, and that this diminution in value was sometimes more rapid in one country than in another; but in every case the diminution has been considerable. In England, where the decrease has been less than in any other country in Europe, a nominal pound of coin now is somewhat less than one third of its original weight; 62 shillings now being only equal to twenty shillings then. In Scotland, the nominal pound is at present only about one fortieth part of the original pound of silver. In France it is little more than one sixtieth part of the original pound; and in other countries the variation is still greater. If we wish to form any thing like correct notions of the proportional value in silver of a commodity in any one country at a former period, to that which it bears at present, it behoves us to know what was the precise weight and fineness of the coin in that country at the period mentioned; for, without this, we cannot form any sort of judgment whatever on the subject.

It would require a great deal of research to be able to exhibit all the changes that have taken place in the different countries of Europe. All, therefore, that shall be attempted on the present occasion shall be, to exhibit a comparative view of the changes in this respect that have taken place in England and Scotland; which we are enabled to do by the labours of

the ingenious Mefsrs. Lowndes and Fleetwood, who collected the annexed table of English coins; and to Mr. Ruddiman for those of Scotland. Similar tables of the monies of France might easily be obtained; but this would serve to make the disquisition too complex; our view in this place being only to enable the reader to form a clear idea of the nature of this circumstance, and the effect that it ought to have upon his mind in inducing caution respecting this particular. To bring him into a train of applying the knowledge he will thus acquire in practice, a few illustrative examples shall be given; and, to facilitate his calculations, a table shall be added, of the decimals of the different denominations of the British coin, with examples how to use it.

It deserves to be remarked, that the nominal pound of money in all the nations of Europe, in as far as I can learn, were all nearly the same with the real pound till towards the beginning of the fourteenth century; about which period the practice of varying the weight of the same denomination of coin began. I cannot learn who set the first example of this embarrafsing innovation; but, whoever it was, it is very evident, from the concurrent testimony of historians, that the practice rapidly prevailed over all Europe. In regard to the two nations we now compare, it will appear that England took the lead both in diminishing the weight and debasing the alloy of the coins, but that Scotland readily followed the example, and too often improved upon it.

TABLE I.

Shewing into how many pounds, shillings, and pence, a pound-weight of silver hath been coined at various periods, with the proportion of alloy that it contained.

In England.

A.D.	Reign.	F. oz.	S. dw.	Alloy. oz.	Alloy. dw.	Tale. s.	Tale. d.
	Before Edward I.....	11	2	0	18	20	0
1299	28 Edward I.....	11	2	0	18	20	3
1346	20 Edward III.	11	2	0	18	22	6
1353	27 Edward III.	11	2	0	18	25	0
1421	9 Henry V.	11	2	0	18	30	0
1422	1 Henry VI.	11	2	0	18	37	6
1425	4 Henry VI.	11	2	0	18	30	0
1460	19 Henry VI.	11	2	0	18	37	6
1509	1 Henry VIII.	11	2	0	18	45	0
1542	14 Henry VIII.	10	0	2	0	48	0
1544	36 Henry VIII.	6	0	6	0	48	0
1545	37 Henry VIII.	4	0	8	0	48	0
1549	3 Edward VI.	6	0	6	0	72	0
1551	5 Edward VI.	3	0	9	0	72	0
1552	6 Edward VI.	11	1	0	19	60	0
1554	2 Mary,.....	11	0	1	0	60	0
1559	2 Elizabeth,.....	11	2	0	18	60	0
1600	43 Elizabeth,.....	11	2	0	18	62	0

Since which it hath continued the same both as to weight and fineneſs.

In Scotland.

A.D.	Reign.	F. oz.	S. dw.	Alloy. oz.	Alloy. dw.	Tale. s.	Tale. d.
	Before Robert I.	11	2	0	18	20	0
	Robert I.	11	2	0	18	21	0
1366	37 David II.	11	2	0	18	25	0
1367	38 David II.	11	2	0	18	29	4
1373	3 Robert III.	11	2	0	18	32	0
1432	9 James I.	11	2	0	18	37	6
1450	9 James II.	11	2	0	18	64	0
1455	14 James II.	11	2	0	18	96	0
1474	15 James III.	11	2	0	18	144	0
1482	23 James III.....	11	2	0	18	140	0
1529	16 James V.	11	0	1	0	192	0
1554	13 Mary, ...	11	0	1	0	260	0
1564	23 Mary, ...	11	0	1	0	360	0
1571	4 James VI.....	9	0	3	0	334	0
1577	10 James VI.....	8	0	4	0	334	0
1579	12 James VI.....	11	0	1	0	440	0
1581	14 James VI.....	11	0	1	0	480	0
1597	30 James VI.....	11	0	1	0	600	0
1601	34 James VI.....	11	0	1	0	720	0
1659	19 Charles II.	11	2	0	18	744	0

Since which it hath continued the same both as to weight and fineneſs.

TABLE II.

Shewing the comparative value of the coins in England and Scotland, with the several alterations they have undergone, from the earliest accounts to the present time. N. B. The names of the English monarchs are printed in Roman characters, and those of the Scottish in Italics.

One pound of money at the following periods contained grains of fine silver, which were of the value in our present money, as below.

		In England.		In Scotland.	
A.D.	*Reign.*	*F. S. Grains.*	*Pres. Val. L. s. d. f.*	*F. S. Grains.*	*Pres. Val. L. s. d. f.*
1298	Before this time.	5328.00	3 2 0 0	.....	.....
1299	28 Edward I. ..	5262.22	3 1 2 3	.....	.....
1300	*Robert I.*	.....	.....	5074.20	2 17 10 2
1346	20 Edward III. .	4736.00	2 15 1 2	.....	.....
1353	27 Edward III. .	4262.40	2 9 7 0	.....	.....
1366	37 *David II.* ...	.....	.....	4262.00	2 9 7 1
1367	38 *David II.* ...	.....	.....	3637.72	2 2 4 0
1373	3 *Robert III.* ..	.....	.....	3330.00	1 18 9 0
1421	9 Henry V. ...	3552.00	2 1 4 0	.....	.....
1422	1 Henry VI....	2841.60	1 13 0 3	.....	.....
1425	4 Henry VI....	3552.00	2 1 4 0	.....	.....
1432	9 *James I.*	.....	.....	2841.60	1 13 0 3
1450	9 *James II.* ...	.....	.....	1665.00	0 19 4 2
1455	14 *James II.* ...	.....	.....	1110.00	0 12 11 0
1460	39 Henry VI. ..	2841.60	1 13 0 3	.....	.....
1474	15 *James III.* ..	.....	.....	740.00	0 8 7 1
1482	28 *James III.* ..	.....	.....	761.14	0 8 10 1
1509	1 Henry VIII..	2368.00	1 7 6 2	.....	.....
1529	16 *James V.*	.....	.....	550.00	0 6 4 3
1542	34 Henry VIII..	2000.00	1 3 3 1	.....	.....
1544	36 Henry VIII..	1200.00	0 13 11 2	.....	.....
1545	37 Henry VIII..	800.00	0 9 3 3	.....	.....
1549	3 Edward VI...	800.00	0 9 3 3	.....	.....
1551	5 Edward VI...	400.00	0 4 7 3	.....	.....
1552	6 Edward VI...	1768.00	1 0 6 3	.....	.....
1554	2 Mary, ...	1760.00	1 0 5 3	.....	.....
1554	13 *Mary*, ...	.....	.....	406.00	0 4 8 3
1559	4 Elizabeth....	1776.00	1 0 8 0	.....	.....
1564	23 *Mary*, ...	.....	.....	293.00	0 3 5 0
1571	4 *James VI.*	.....	.....	258.00	0 3 0 0
1577	10 *James VI.*	.....	.....	244.20	0 2 10 0
1579	12 *James VI.*	.....	.....	240.00	0 2 9 2
1581	14 *James VI.*	.....	.....	220.00	0 2 6 3
1597	30 *James VI.*	.....	.....	176.00	0 2 0 3
1600	43 Elizabeth, ...	1718.7	1 0 0 0	.....	.....
1601	34 *James VI.*	.....	.....	146.60	0 1 8 2
1659	19 *Charles II.* ..	.....	.....	143.2	0 1 8 0

On comparing the two columns of the above table, the following particulars are observable.

It appears, that Edward the First of England set the example of beginning to diminish the coin; who, anno 1299, reduced the pound of money from 5328. to 5262.22 grains of pure silver. This example was immediately imitated by Robert I. of Scotland; who, in the next year, 1300, diminished his coin also, but went beyond Edward, by reducing the pound to 5074.20 grains of silver.

In this state the coins of the two nations continued for the space of 45 years, the pound of Scotland being all this time lefs than that of England by 188.02 grains of pure silver.

Anno 1346, Edward III. of England diminished his pound to 4736. grains, which was 338.2 grains lefs than that of Scotland: at this rate it continued 7 years, when Edward diminished it farther to 4262.4, which was 711.8 grains below the monies of Scotland; at which rate it continued till anno 1366. During this period of twenty years, therefore, the nominal monies of Scotland were considerably superior in value to those of England.

Anno 1366, however, David II. of Scotland equalised his coin with that of England; and he, not content with this, in the year following diminished it still farther to 3637.72 grains, being 624.68 grains below that of England. Six years afterwards, Robert III. of Scotland reduced it farther to 3360. grains; that is, 702.4 grains lefs than that of England; at which rate it continued until the year 1421. During this period, then, of 57 years the monies in Scotland were inferior

in value to those of England, nearly in the same degree as they had exceeded them for the former 20 years.

Anno 1421, Henry V. of England reduced his nominal pound to 3552 grains, which was 222 grains better than that of Scotland: but in the following year he lowered it to 2841.6 grains, which made it 488 grains leſs than that of Scotland. Two years afterwards it was raised by Henry VI. to 3552 grains; at which rate it continued for 35 years.

Anno 1432, James I. of Scotland reduced his money to the former reduced standard of England, being for the pound 2841.6 grains; so that it was now 710 grains leſs than that of England; at which rate it continued 18 years.

Anno 1450, James II. of Scotland lowered the pound still farther to 1665 grains; which is no leſs than 1887 grains short of that of England; and after five years he lowered it still farther, making his pound only 1110 grains, being 2442 grains leſs than the pound of England; so that the Scots pound of money was now little more than one third of the value of the English pound.

Hitherto the monies of England and Scotland have been nearly upon a par; sometimes the one and sometimes the other preponderating; but from the period of James I. of Scotland the balance becomes clearly in favour of England; and it never (except at one period) equalised English money since that time. It is plain from the slightest inspection, that the conduct of these princes was in all cases in some measure influenced by that of each other.

Anno 1460, Henry VI. of England reduced his pound to 2841.6 grains; but even then it was 1731 grains better than that of Scotland, being lefs than half its value. Still, however, the Scottish monarchs, prefsed by wants which they knew not how to supply, continued farther to decrease their coin; so that, anno 1474, James III. reduced his pound to 740 grains, being 2101.6 grains short of that of England; but after 8 years trial he raised it to 761.14 grains, at which rate it continued for 47 years, being for 20 years little more than one fourth the value of the English pound.

Anno 1509, Henry VIII. of England lowered his pound to 2368 grains; so that now Scots was to English money as three to one nearly; but in 1529 it was lowered by James V. of Scotland to 550 grains, which brought it once more to the proportion of one fourth of English money nearly.

Hitherto all the alterations that took place in the coins of either nation consisted entirely in reducing the weight of the coins respectively. But, in the year 1542, Henry VIII. of England first diminished the fineneſs of the silver by augmenting the alloy, reducing his coin first to 2000 grains of pure silver, and afterwards, by succefsive debasements of the same sort, to 1200 and 800. This was still farther debased by Edward VI. who went so far, anno 1551, as to make the coin 3 oz. silver only, and 9 ounces alloy. The pound of this money contained only 400 grains of pure silver, while that of Scotland at the same period contained 550 grains; so that the English money was then inferior to Scots by 180 grains in the pound. This,

however, continued but for a very short time; as the money was raised by Edward to its present standard of fineneſs nearly, and weight, and was fixed nearly as it now remains by Elizabeth; while the monies of Scotland, though they continued always of the standard fineneſs, except for a few years in the reign of James VI. underwent a succeſsive series of diminutions till the 19th of Charles the Second, when it had dwindled to 143.2 grains of pure silver, value 1s. 8d. sterling, at which rate it continued ever after.

In the above table I have chosen not only to expreſs the value of a pound of money at each period that any alteration took place, in sterling money at present, but have also marked the grains of pure silver contained in such pound of money at each period, that the reader may be enabled, with little trouble, to convert any sum that may be mentioned at any period of British history into present sterling money; which may be done with the greatest facility by means of the following table.

TABLE III.

Shewing the number of grains of pure silver contained in the different kinds of money of Great Britain, from one farthing to a thousand pounds sterling.

Sterling. Farthings.	*Grains.*
1	= 1.790
2	= 3.580
3	= 5.370
Pence.	
1	= 7.161
2	= 14.322
3	= 21.483
4	= 28.645
5	= 35.806
6	= 42.967
7	= 50.129
8	= 57.290
9	= 64.451
10	= 71.612
11	= 78.774
Shillings.	
1	= 85.935

Sterling. Shillings.	*Grains.*
1	= 85.93
2	= 171.87
3	= 257.80
4	= 343.74
5	= 429.67
6	= 515.61
7	= 601.54
8	= 687.48
9	= 773.41
10	= 859.35
11	= 945.29
12	=1031.22
13	=1117.16
14	=1203.09
15	=1289.03
16	=1374.96
17	=1460.90
18	=1546.83
19	=1632.77

Sterling. Pounds.	*Grains.*
1	= 1718.709677418
2	= 3437.419354836
3	= 5156.129032254
4	= 6874.838909672
5	= 8593.548387090
6	= 10312.258064508
7	= 12030.967741926
8	= 13749.677419344
9	= 15468.387096762
10	= 17187.096774180
20	= 34374.193548360
30	= 51561.290322540
40	= 68748.387096720
50	= 85935.483870900
100	= 171870.967741800
200	= 343741.935483600
300	= 515612.903225400
400	= 687483.870962200
500	= 859354.838709000
1000	=1718709.677418000

Directions for the use of these Tables.

When you want the value of any sum at any particular period, by looking at Table II. you see how many grains of pure silver were contained in a pound of money at that time; which, being multiplied by the number of pounds specified, shows the number of grains of silver contained in the whole sum.

To reduce this into present sterling money, look at Table III.; and, having subtracted the sum next below it in that table from your total amount, the index opposite to it will point out the nearest whole sum in sterling money. If there is any quotient, look again

into the table, and subtract the next nearest sum, whose index will point out the value in sterling money; and so on, continually subtracting the quotient, you obtain the smaller sums contained in it to the value of a farthing.

EXAMPLES.

In the year 1316 a quarter of wheat sold in England at 4l.; what would be the value of that quarter of wheat in the present money of Great Britain?

By Table II. it appears, that in the year 1316 the pound of money in England contained 5262.22 grains of pure silver; but $5262.22 \times 4 = 21048.88$; so that 4l. contained 21048.88 grains; which may be reduced to the present money of Britain by the help of Table III. thus:

21048.88					
17187.09	= £10	0	0	0	
3861.79					
3437.41	= 2	0	0	0	
424.38					
343.74	= 0	4	0	0	
80.64					
78.77	= 0	0	11	6	
1.87					
1.79	= 0	0	0	1	
8	£12	4	11	1	

So that wheat at that time sold for twelve pounds four shillings and eleven pence farthing per quarter of the present money of Great Britain; that is to say, the four pounds then contained as much silver as would have amounted to that sum if coined in our mint at present.

If the sum you want to ascertain does not consist of an even number of pounds, the shillings may be thus reduced. Divide the number of grains of which the pound consisted at that time by 20, which gives the number of grains in a shilling; and then multiply that by the number of shillings whose value you want to obtain.

EXAMPLE.

In the year 1346 wheat sold for two shillings per quarter. Now at that time, by Table III. it appears, that the pound contained 4736 grains; therefore $\frac{4736}{20}$ =236.8×2=473.6 grains in 2 shillings, thus,

```
20)4736(236.8
   40      2
   ---     ---
    73   473.6 = to 2s. at that time.
    60   429.6  £.0  5  0  0
   ---   -----
   136    44.0
   120    42.9     0  0  6  0
   ---    ----
    16.0  1.1
    16.0
                  ------------
                  £.0  5  6  0 of our present money.
```

If the fractions go as low as pence, they may be reduced into grains, either by dividing the shilling by 12, or the pound by 140, and then multiplying by the number of pence.

EXAMPLE.

In the year 1269 wheat sold at 6l. 8s. 4d. per quarter,—required the present value in Sterling money.

Anno 1269, it appears by Table II. that the pound contained 5318 grains of pure silver, therefore 5318 ×6 gives 34188.0 grains in 6l. To obtain the number

of grains in a shilling divide the number of grains in a pound by 20, thus,

```
20)5328(266.4 The grains in one shilling, hence 8 shillings
 40           are 266.4 × 8 = 2131.2 grains
----                    8
 132          ---------
 120          2131.2
----
 128
 120
---
  80
  80
```

To obtain the number of grains in a penny divide 266.4, the grains in a shilling, by 12; this gives 22.2, the grains in one penny, which multiplied by the number of pence (4) gives 88.8, the grains in 4 pence, thus,

```
12)266.4(22.2        22.2
  24       4          4
----     ---        ---
  26     88.8       88.8
  24
----
 2.4
 2.4
```

These, when put together, will stand thus, anno 1269.

```
£.6  0  0 = 31968   grains
  0  8  0 =  2131.2 grains
  0  0  4 =    88.8 grains
-------     -------
£.6  8  4 = 34188.0 grains. From these deduct by the table
            17187.09 grains of our present money in £.10  0  0
            --------
            17000.91 remain; from which deduct
            15468.38 grains of ditto in ..... 9  0  0
            --------
             1532.53 remain; from which deduct
             1460.90 grains of ditto in ..... 0 17  0
            --------
               71.63 remain; deduct
               71.61 grains of ditto in ..... 0  0 10
                                              ---------
                                          £.19 17 10
```

A quarter of wheat, therefore, in the year 1269 sold for 19l. 17s. 10d. of our present money!!!

In old times it was customary to expreſs great sums by marks as often as by pounds. Where this occurs, the grains contained in a mark may always be found by dividing the pound at that time by three, and multiplying by two; a mark having been at all times exactly two thirds of a pound, or eight ounces.

EXAMPLE.

In the year 1244, Henry III. of England found, that the Pope at that time drew annually out of England 60,000 marks. What would be the value of this in pounds sterling at present?

At that time the pound contained 5328 grains, therefore $\frac{5328}{3} \times 2 = 3552$, the number of grains in a mark, hence

	3552				
Marks.	60,000				
60,000 =	213120000 grains.	The next No. below that in Table III is			
	171870967.74 grains =	£	100,000	0	0
	41249032.26				
	34374193.54 grains =		20,000	0	0
	6874838.72				
	6874838.70 grains =		4,000	0	0
	2				
60,000 marks then were equal to		£	124,000	0	0 sterling at present

The reader, who is not much conversant in decimal arithmetic, may perhaps be at a loſs clearly to understand the above example.—Let him then be told, that any sum may be multiplied or divided by ten by adding or taking away one figure at the right-hand side of the number.—Keeping this in his mind, let him look into Table III. he will find opposite to 10l. the

number 17187.096774; but the number 17187 is four figures short of the number 213120000, which he was in search of. Remove, therefore, the decimal point four figures to the right, and it becomes 171870967.74; and the index 10, having four figures added to it, becomes 100000.

In the same manner the next quotient requires the decimal point to be removed three figures to the right-hand; so that 20 now becomes 20000;—and the next number 40, by the addition of two cyphers, becomes 4000; so that the whole amounts to 124,000l.

It was to enable the reader to find out any large sum without multiplication, that the decimal figures were carried to such a depth: for, by removing the decimal point one figure back, it comes to expreſs just ten times its former value; so that the sum opposite to one pound may be made to expreſs any whole sum beginning with the figure 1, as under.

1	1718.709677418
10	17187.09677418
100	171870.9677418
1,000	1718709.677418
10,000	17187096.77418
100,000	171870967.7418
1,000,000	1718709677.418
10,000,000	17187096774.18
100,000,000	171870967741.8
1,000,000,000	1718709677418.

and in the same manner may the figures 2. 3. 4. &c. be made to expreſs any sum beginning with either of these figures, without any farther trouble but that of adding as many cyphers to the right-hand side of the index as you find it neceſsary to remove the decimal point backwards.

This being premised, I shall add a few other examples that may serve to amuse the reader a little, and make this subject somewhat more familiar to him.

It is remarked by historians, that David I. of Scotland endowed religious houses during his own reign to the amount of 60,000l. a year.—This was besides what had been endowed before his time.

To ascertain the real value of that sum, we must remember, that the pound in Scotland at that time, as well as in England, contained 5328 grains of fine silver, therefore

5328				
60000				
319680000				
171870967.74	= £.	100,000	0	0
147809032.26				
137496774.19	=	80,000	0	0
10312258.07				
10312258.06	=	6,000	0	0
01	£.	186,000	0	0

He granted to the clergy £.186,000 above what they formerly enjoyed.

The whole revenues of the clergy in Scotland at present hardly amount to 60,000l.; so that this prince alone gave away to upwards of thrice that amount, besides what had been allotted to them formerly.—And if it be supposed that money then was about three or four times the value it bears at present, we may reasonably compute that the revenues of the clergy in Scotland at that time could not be short of 800,000l. sterling.

Anno 1269, Alexander king of Scotland refused to allow the Pope's nuncio to come into his kingdom, or levy any money for the purpose of the holy wars;

but, of his own free gift, sent a present to the Pope of a thousand marks for that purpose.

At this time the pound of money in Scotland contained 5328 grains; therefore $\frac{5328}{3} \times 2 = 3552$ grains in a mark, hence

	3552				
	1000				
1000 marks ...	3552000	grains			
but	3437419.08	grains are	£.2000	0	0
	114580.97				
and	103122.58	grains	60	0	0
	11458.39				
and	10312.25	grains	6	0	0
	1146.14				
and	1117.16	grains	0	13	0
	28.98				
and	28.64	grains	0	0	4
	34				

1000 marks then equal in present money £.2066 : 13 : 4 which was the amount of the annual donation to the Pope in those days from Scotland.

Had the same donation been continued till the time of Charles II. or his brother James VII. of Scotland, the amount would have been as under. At this latter period the pound contained only 143.2 grains of silver; therefore $\frac{143.2}{3} \times 2 = 95.4$ grains in a mark. Hence

	95.4				
	1000				
1000 marks	95400.0	grains			
but	85935.48	grains are	£.50	0	0
	9464.52				
and	8593.54	grains	5	0	0
	870.98	carried forward			

Brought forward	870.98	£.55	0	0
and	859.35 grains	0	10	0
	11.63			
	7.16 grains	0	0	1
	4.47			
and	3.68 grains	0	0	0½
	89	£.55	10	1½

so that 1000 marks at this latter period would have amounted to no more than 55l. 10s. 1½ nearly, so that at the former period the same nominal sum was nearly forty times its amount at the latter period.

In the year 1354 the exports from England of wools, and woollen manufactures, were as under, viz.

	£.	s.	d.
Thirty-one thousand six hundred fifty-one sacks and a half of wool, at 6l. value each sack, amount to	189909	0	0
Three thousand thirty-six hundred sixty-five felts, at 40s. value each hundred, at six score, amount to	6073	1	8
Whereof the customs amount to	81624	1	1
Four thousand seven hundred and seventy-four cloths and an half, at 40s. value each cloth	9549	0	0
Eight thousand sixty-one pieces and a half of worsted, after 16s. 8d. per piece, is	6717	18	4
Whereof the customs amount to	215	13	7
Total exports of wool and woollen goods,	£.294088	14	8

At this time the pound contained 4262.4 grains of pure silver; therefore

29408.8	and 20)4262.4	(213.12	and 12)213.12	(17.76
4262.4	40	14	12	8
117635.2	26	852.48	93	142.08
588176	20	2131.2	84	
1764528	62	2983.68	91	
588176	60		84	
1176352	24		72	
1253520691.2	20		72	
2983.68	40			
142.08	40			
1253523816.96				

1203096774.19.....	£.	700000	0	0
50427042.77				
34374193.54.....		20000	0	0
16052849.23				
15468387.09.....		9000	0	0
584462.14				
515612.90.....		300	0	0
68849.24				
68748.38.....		40	0	0
100.86				
85.93.....		0	1	0
14.93				
14.32.....		0	0	2
61.....		0	0	0
	£.	729340	1	2

the woollen exports then amounted to 729,340l. 1s. 2d. of our present money.

If it be supposed that the same weight of silver was three times the value as at present, the above sum would be equal to 2,188,020l. 3s. 10½ now; which will tend to show that the trade of England at that time was not nearly so insignificant as is generally imagined.

In the year 1548 wheat sold for 6s. 8d. per quarter; but at that time the pound contained 800 grains of fine silver; therefore

| | | | |

Again, in the year 1455, wheat sold at 1s. per quarter; but in that year the pound contained 3552 grains of fine silver; therefore

20) 3552 (177.6 the grains in one shilling, anno 1455
20 171.87 = 2 shillings at present

155 5.73
140 5.37 = 3 farthings.

152 .36 2s. 3 farthings present money.
140

120
120

the quarter cost 2s. 3f. of the present money of Britain.

I might add more examples, but these will prove sufficient to enable the reader to apply the tables to the solution of any case that may occur to him referable to this clafs. He will observe that, in general, the same denomination of money bore a value greater in proportion to the remoteneſs of the time to which the events relate. Thus, we will find by consulting the tables, that a thousand pounds at the following periods would have been equal to the following sums in our present Sterling money:

	£.	s.	d.		£.	s.	d.
Before the anno 1300 =	3100	0	0	anno 1500 =	1071	10	0
.... 1350 =	2756	3	0	.... 1552 =	1022	18	0
.... 1400 =	2480	0	0	.... 1600 =	1000	0	0
.... 1450 =	2066	19	5				

so that if an annuity of the same nominal amount had continued to be paid all that time, its weight at the latter period would have dwindled to leſs than one-third of what it originally was, independent of the other variations in the value of money that might have taken place during that time.

But although this rule is general, it is not universal; for in the year 1545, 1000l. was only equal to 465l. 6s.

of our present money; whereas in 1565, twenty years later, 1000l. was equal to 1053l. 6s.; and again, anno 1551, 1000l. was only equal to 232l. 8s.; whereas, in the year following, it was equal in value to 1022l. 16s. of our present money. This is less than one-fourth part of its future value. During the eight years that intervened between the thirty-sixth of Henry VIII. to the sixth of Edward VI. the coin was more debased, and bore a smaller value than at any other period of our history. Those, therefore, who read without adverting to these circumstances, are liable to form opinions extremely different from the truth; and I hope my readers will thank me for bringing this circumstance under view, and of putting it in their power, so easily, by the aid of these tables, to calculate with precision the value in weight and fineness of silver, of any specified sum, at whatever period of time they had occasion to observe it.

But besides the difference in the value of money, which is occasioned by an alteration of the coin, there are other circumstances that affect its value considerably, which operate in a more imperceptible manner, and are therefore much less susceptible of being estimated with precision than the other. Silver, like every other commodity, is an article of commerce, and may have its price, when compared with other articles, lowered or raised in the market in proportion as the quantity offered for sale falls short of, or exceeds the demand for it at the time, so that a pound of silver may purchase at one period of time a much greater quantity of the produce of land or manufactures than at another. In this way, there can be no doubt, that

at the earlier periods of our history, before the discovery of America especially, silver was of much greater value; that is, would purchase a greater proportion of the neceſsaries of life than it could do since that period; and as it is the proportion of neceſsaries that a pound of silver can purchase, which constitutes in strict propriety its intrinsic value, it is plain that we cannot ascertain the intrinsic value of a pound of money by merely ascertaining the exact weight of silver it then contained; we only thus free ourselves from the risk of a double deception, by simplifying the case to a certain degree. To ascertain the intrinsic value of silver at all different periods would be an arduous task; as no person, that I know of, has yet attempted to collect the facts that could afford data for it. The only thing of that sort I recollect is the *Chronicum Pretiosum*, by Fleetwood; and it unfortunately happens that he has not taken the trouble to reduce all the denominations of coin to the same standard of weight and fineneſs as might be done by the aid of the above tables; without which, no consistent conclusions can be drawn from the facts he has collected.

The value of money, however, is affected by many other circumstances besides the weight of the silver contained in any given coin, or the market price of silver at the time, so that it may be greatly lowered, or the reverse, without any variation having taken place in regard to these two particulars. It would be an intricate discuſsion, and would require lights that the writer of this article does not poſseſs, to enumerate the whole of these; he will only beg leave just to hint that whatever tends to augment the funds of a state and facilitate the exchange of commodities, must have

a neceſsary tendency to depreſs the value of money; and that depreſsion will be proportioned to the magnitude of these efficient causes. Hence it has happened that although the coin of this country has suffered no variation worth naming since the 43d of Elizabeth either in weight or fineneſs, nor any considerable alteration has taken place in the permanent price of silver; yet it is well known that the value of the same sum of money is now much leſs than it was at that period. Every thinking person must also be sensible that the value of money within the last twenty years has suffered a prodigious depreſsion, which produces effects upon the body politic, that well deserve to be enquired into; and which, if done by a masterly hand, would lead to conclusions of high importance to this nation, and to society in general. This task, then, I beg leave warmly to recommend to such as have talents to attempt it, and means within their power of succeſsfully performing it.

To the Editor of Recreations in Agriculture, &c.

QUERIES RESPECTING THE SYMBOLIC CHARACTER.

SIR,

I have read with much satisfaction, and I hope profit, your very interesting papers on the symbolic character. These papers have entirely convinced me of the practicability, as well as utility, of that manner of writing, should it ever be introduced into general practice; though, in regard to this last particular, I feel similar doubts to those which seem so strongly to impreſs your own mind. Mankind are slow to adopt improvements; especially such as re-

quire much mental exertion, and where immediate emolument to the individual is not to be expected; which, I am sorry to say, is too evidently the case with this invention. The public through every department of business would be nearly alike benefited by it, while the individual by whose labours this universal improvement should be effected, might receive no proper recompense for his trouble. To compose a dictionary of the kind that you hint at, must be a work of great labour, and would require the fullest exertion of talents of a very superior kind; and, though there can be little doubt, that were such an undertaking *properly* completed, the work itself in time might be sufficient to afford an ample remuneration to its author; yet, as much time must elapse before it could be perfected, and as much expense must be incurred in the mean while, it cannot be supposed that any man who was able and willing to perform this task could afford the expense that would be thus incurred: not to mention the inevitable loss to which his family must be subjected in case death or disease should prevent him from perfecting his plan.

From all these considerations, I am clearly convinced, that, unless a fund could be provided for affording a reasonable salary to the person so employed, to be paid to him regularly at stipulated periods while he was engaged in the work, it never can be put into a train of accomplishment. I should think, that in these days of public spirit it would be no difficult matter to raise such a fund by means of voluntary subscription; and I cannot doubt that if you, Mr. Editor, were to solicit such a subscription, the public

would have such confidence in any person whom you should recommend, as to come forward with alacrity. But this is a delicate subject for one who is an entire stranger to you to propose, and, therefore, I desist.

The above was not in my contemplation when I began this letter; and I have only wandered imperceptibly from the subject that I proposed; which was, merely to say, that I imagine it would have proved very satisfactory to most of your readers (at least it would have been particularly so to myself), if you had given some general notions of the manner in which a current *script* symbolic character might be formed; for, although I have not a doubt that this may be effected with as much facility as you have showed could be done respecting printing types; yet, as neither me nor most of your readers have turned our thoughts to that subject, (nor could we perhaps easily devise any thing of the sort if we did) and as it is probable that you have done so, I wished to request the favour of you, if it be not incompatible with your own arrangements, to favour us with a few hints on that head. This would have the good effect of setting others at work, to try to improve upon any loose hints that you might offer. It would be an additional favour if you would give some idea of the manner in which the tenses and other parts of the verb might be so arranged as to be simple and distinct; which I have no doubt would prove equally satisfactory as those respecting number and person in the pronoun. I wish, in short, that none of your ideas on this subject should be lost; for, if they should not be adopted at the present time, they may perhaps prove of use at some future period.

I hope you will pardon the freedom of this addreſs from a constant reader of all your writings.

PHILOLOGOS.

The above friendly hints of *Philologos* demand from me a grateful acknowledgment, and such farther explanations as can be easily afforded. With regard to the first particular, subscriptions are so often solicited for the purposes of deception, and to promote particular interests, as to prove a strong inducement to one who has no particular interests to serve, to decline placing himself for one moment in a situation that might expose his conduct to suspicions that he wishes to avoid. This, he conceives, will be admitted as a sufficient excuse for his declining to take any active part in the buſineſs. At the same time, he is so strongly convinced of the benefits that might be derived to society from the carrying into effect a mode of writing on the principles above explained, and of the practicability of the measure; that should a few gentlemen of fortune feel an inclination to appropriate each a small sum annually, to be applied for the purposes above named for a limited time, under the superintendance of a committee of their own members, he would be ready to meet them when required to give them every aſsistance in his power for facilitating the enterprize: nor does he know of any way in which a few liberal-minded individuals could more easily secure for themselves a distinguished rank in the annals of literature, than this might ensure them. In doing this, he thinks he performs all that is incumbent upon him as a member of the community.

In farther compliance with the request of this re-

spectable correspondent, he shall subjoin a few hints that have occurred to him since the receipt of his letter on the formation of a current *script* symbolic character; merely with a view to show, that there could be no difficulty in devising such a character, should it ever obtain the serious consideration of any person who was qualified for entering upon such disquisitions.

For the purpose of rendering the printed and the written characters as little different from each other as poſsible, but merely to render the characters more easy to be traced by the pen, the basis of the character might be the same in both cases; that is to say, the straight line, with the differential marks as described p. 90: but, instead of placing this line in a perpendicular position as in print, let it be laid in a horizontal position in writing; its proportions and parts being the same in both cases, and in no other respect varied than would naturally take place if the character ⊦ for example had its top inclined to the right hand until it aſsumed a horizontal position thus ⊢ and so on every other character. In this way it would be very easy to mark the differential characters with the pen in writing.

The reader will easily perceive, that a little practice would bring any one to trace all the distinctive characters in this way by the pen, with as great rapidity and ease as the common written characters now in use, in as far as respects the first series of indexes both primary and secondary (see p. 90); both of these consisting of plain strokes only, placed in a direction perpendicular to the radical stroke of the character. But when we proceed to the second, third, fourth, and

other series of indexes, alike primary and secondary, (p. 90) there would require to be so much nicety in delineating these characters so as to preserve their distinctive differences, that it would not be posſible to do it with the pen, without the risk of blotting or disfiguring them so much as to occasion errors and perplexity that might prove extremely embarraſsing.

To obviate this inconveniency, let the written character through the whole series of indexes be unvaried, being only a horizontal stroke for the whole; only varying the marks above and below, as the character requires. And, as each series of indexes, both primary and secondary, succeed each other in a regular order, 1, 2, 3, &c. (see p. 90, primary and secondary indexes), instead of delineating the character, mark only the *number* of each character in Arabic figures, to denominate the index. Thus, instead of delineating the character  which it would be very difficult to do, I find that this belongs to No. 6, of the primary index, and No. 8. of the secondary index: mark it so then, $\frac{6}{8}$, and the character is as distinctly defined as if it had been delineated with the utmost precision. This mode of varying the power of the same characters has been long familiar to mathematical scholars, and is known to occasion no sort of embarraſsment. Thus 15,10 is well known to be equivalent to $15\frac{1}{10}$, and $\cdot 5$ is known to be the same with 5555 continued in infinition; so also $\cdot\dot{2}\dot{4}$ is the same with 242424 and so on. A similar mode is adopted to denote a simple number, or the square, the cube, &c. of the same number; and many other distinctions of a like nature, which are known to afford infinite facilities in practice, without the smallest tendency to

confusion: nor can there be a doubt, that the practice here recommended would be productive of similar facilities and precision. In a dictionary, along with each character might be placed its numerical index, thus, $\frac{6}{8}$; so that it might be searched for either by its numerical index, or symbolic character, as occasion might require.

With regard to the *form* of the same character, as indicating different parts of grammar, it would be convenient to vary it a small degree from the printed type, without, however, deranging the order; for, instead of making the second leg turn back in the same direction with the first, it might more conveniently be continued after the bend in the same direction with the first, thus ⌐. By this means it could be easily written; and if any distinctive marks are required, either on the last leg or the cross bar, they could be easily marked with the pen. Thus, for example: supposing it were thought proper to mark the six cases of the Latins in the printed characters ⌊ genitive 2, (the nominative having no mark for case) ⌊ dative 3, ⌊ accusative 4, ⌊ vocative 5, ⌊ ablative 6. These marks might, in writing, be entirely omitted, and the cases be notified with equal precision merely by subjoining the Arabic number corresponding to it. The plural in all cases to be denoted by a dot, and the gender by the generic character placed above the first leg of the character, thus $\underset{\cdot}{\overset{v}{\lceil}}{}^{4}$ which would denote the accusative plural masculine gender. But, if it should be judged more expedient to denote the cases by prepositions as in English, only marking the accusative case so as to distinguish it from the nominative, this might

be done by putting prepositive marks before the noun for the other oblique cases, marking the accusative only by a stroke at the left hand side of the perpendicular leg, thus  . The definitive also, which as often occurs in respect to nouns as pronouns, might be marked by a stroke on the right side of the perpendicular leg, thus  ; and the posſesſive by a stroke through it, thus  . The pronoun should preserve all its distinctive characters the same as in the printed character, and only differ from the noun, as it does in the printed character by keeping the joining bar a little from the end of the other two legs, thus  .

The verb would naturally be discriminated from the noun by making the first leg above and the second below, thus  ; the distinctive characteristic mark being put upon the first leg precisely as has been indicated for the nouns. The adjective and adverb, by pursuing the same general analogy, would be written adjective  and adverb  . Taking as an example the word *love*, as before, p. 96. The noun *love* would be  , the adjective *lovely* would be  , the verb *to love* would be  , and the adverb *lovingly*  .

I do not pretend here to enter into any account of the methods that might be devised for marking the moods, and other constituent parts of the verb; for it will readily occur to the reader, that, with regard to this particular, it would be very easy to devise abundance of discriminative marks; but it would require a degree of attention which in the present state of things it would be idle to bestow upon it, to discover which would be the least objectionable. I shall only suggest, that the tenses might be easily indicated by marks upon the right hand leg of the noun; for the first tense in

order, (having its proper grammatical name), by a mark at the bottom of the right side; the second, at the middle; and the third, at the top of the same leg, as in No. 2, 3, 4, of the first primary index, order of succeſsion; and three more on the right hand, of the same leg, as in 1, 2, 3 of the secondary index, order of succeſsion, p. 90. Hence, in writing,  would indicate the *present* tense, either indicative or subjunctive;  the imperfect, according to Ruddiman's arrangement, and so on; and it might be optional in the writer, either to mark it thus, or by numbers, 1, 2, 3, &c. at the end of the character, thus  3 the perfect,  6 the future. The persons might be marked on the middle leg, as is indicated p. 100; or, what would be more simple still, by marking a single stroke on the left hand side of the middle line for the first person, thus  ; on the right hand side for the second person, thus  ; and, for the third person, a line on both sides, thus  . The plural being denoted by dots, instead of the lines, as on the table of pronouns, p. 66.

I shall not detain the reader longer upon this subject. The above examples will be sufficient for the purpose of illustration, and more is not intended.

I may add, however, that since the paper on the symbolic character that appeared in the last Number of this work was printed, I have been favoured with two communications which tend strongly to confirm the opinion that I expreſsed as to the obvious utility of a contrivance of this sort, and the facility with which it might be accomplished by any one who turns his attention to the subject. The first is, a publica-

tion by Thomas Northmore, Esq. entitled, A Quadruplet of Inventions; one of which is, a contrivance for forming an universal character, to answer in a great measure the same purposes that I propose in the above eſsay. As might be expected in a case of this sort, where no communication took place between the parties, though the end proposed be nearly the same, the means adopted for attaining that end are eſsentially different. Mr. Northmore proposes to effect the whole by means of different ingenious arrangements of the common Arabic numerals alone. The curious reader will derive pleasure from consulting this little eſsay. It is to be regretted that it is too short to give a full display of the subject under a variety of points of view.

The other communication is from an obliging correspondent, which I shall beg leave to give in his own words: "Sir, after having read the hints that you "have thrown out in the last three Numbers of your "Recreations, upon the means of adopting an uni-"versal symbolic character, I could not help being "greatly struck at reading the following article in a "catalogue of books belonging to the Sion College "library. I found this catalogue in the British Mu-"seum, from which I transcribe the article verba-"tum: *The universal character, by which all na-"tions may understand one another's conceptions, "reading out of one common writing their own mo-"ther tongue, by Cave Beck*, M. A. 8vo. London "1657, IB. xi. 55.

"You may make what use of this intimation you "judge best.

Dec. 15th, 1801. PHILO-BIBLOS."

I consider myself greatly obliged to this correspondent, and shall be much more so to any of my readers who can help me to a copy of that work, or a sight of it, if a copy cannot be obtained. I am altogether a stranger to the institution called Sion College; and do not so much as know where it is situated, or to whom I could apply for a sight of that volume; and will be thankful for any information respecting it. In the mean time, I cannot expreſs in terms sufficiently strong, my satisfaction at finding that so many other persons who have turned their attention to this subject, have been led to precisely the same conclusion with myself; every one of them having been able clearly to perceive the practicability as well as the utility of the plan. I am not, however, by any means surprised that it has never been carried into effect, though so obviously attainable by those who contemplate it; for, until a dictionary be formed for that language, all attempts to bring it into use must prove futile; and those in former times would feel at least as great obstructions to that enterprise as we do at present. If I can get a sight of the above work, I shall not fail to give my readers some idea of the outlines of the plan, and point out the coincidences or differences between it and that which has occured to myself on the same subject.

The communication from *P. D.* is received, but the Editor fears that many of his readers may think that the object to which it alludes, has already obtained fully as much room as its importance calls for. He will consider of it.

The paper of *Dubius* is alſo received. It came too late for this Number. The subject deserves ſome attention. It will appear next Number should room be found for it.

35.

JANUARY 1802.

RECREATIONS, &c.

N° 5. Second Series, Vol. II.

Reflections on the natural-history of Fishes.

No branch of natural-history is leſs known than that which respects the instincts, habitudes, and peculiarities of fishes: nor is this much to be wondered at; for, the element which they inhabit is of such vast dimensions as to prevent man from being able to follow them into their secret haunts, and there to observe their modes of procedure with regard to the ordinary functions of animal life. Even birds, which are much more palpable to our senses in moving through their natural element, the air, cannot, on many occasions, have the progreſs in their larger migrations distinctly traced; but fishes can, not only in this respect, but many others, so easily withdraw themselves beyond the influence of human power, that it is no wonder if we should be but imperfectly acquainted with the circumstances that affect them.

We know enough of them, however, to be sensible, that in regard to their natural instincts and habitudes, the different kinds of fishes vary very much from each other; perhaps as much as the various claſses of ter-

restrial animals. Some kinds, like man, seem to be dispersed pretty equally throughout all parts of the world; while others are solely confined to particular regions: some may be said to be of a solitary nature, like the heron among birds, which is seldom seen to associate with others of its kind in great numbers; while others are never to be found but in multitudes: some continue nearly stationary in one place at all times; while others seem to be wandering perpetually from place to place, and never fix in any one station for a continuance of time: some, though they continually frequent the same haunts, and never depart far from their native spot, yet change their stations within these limits, at certain fixed seasons, with the most steady regularity; while others, though they show a similar predilection for a certain spot for a number of years, where they make their appearance with tolerable regularity at certain seasons, will afterwards abandon these haunts so as never afterwards to be seen there for many years together. With regard to the causes of some of these phenomena we can form plausible conjectures; while in respect to others, we are totally unable to give the slightest guefs at the circumstances that should produce these variations. We are nearly as much at a lofs with regard to many other particulars affecting this clafs of animals.

Respecting the longevity of fishes, from reasoning we might be induced to conjecture that it was not intended by nature that the duration of their lives should be fixed to such a short space of time, nor the expansion of size to such narrow limits, as that of terrestrial animals; for the bones of fishes are so much

of a cartilaginous nature, as to admit of being expanded by a natural increment for a much greater number of years than the harder bones of land animals, which soon attain a consistence that does not admit of any expansion; and there are a few facts, pretty well ascertained, which seem to confirm this conjecture. In the royal ponds at Marli, in France, there are some fishes that have been preserved tame since the time, I believe, of Francis the First, and which have been individually known to the persons who have had charge of them ever since that time; these have now attained a size much beyond the common bulk of fishes of the same kind; and, though there are certain peculiarities that distinguish them from younger fishes, yet they give no indication of that decrepitude and disease which are the inevitable accompaniments of a life protracted much beyond the usual period among quadrupeds. It is well known also, that fishermen sometimes catch an individual fish of more than double the size of what is reckoned a full sized fish of that species, especially in those situations where they have been more strictly guarded from danger than is common. Carp and eels of immense size are sometimes caught in ponds that have been carefully secured from common depredators, and at the same time neglected by the owners, for a great number of years; which great size may be justly ascribed to the great age of the individuals: nor is there danger that the old fishes in such situations will be starved by the multitude of younger ones increasing so much as to deprive them of food; for, on whatever food the small fry may subsist, it seems to have been intended by pro-

vidence, that the larger should never want food while the smaller are beside them; for fishes, in general, are observed to prey upon other fishes of any kind that are of a size to be swallowed by them; so that, for the most part, the small fry, even of the same species, become the food of those of larger size.

It has been long a *desideratum* among naturalists, to determine what is the food of plants? This question becomes peculiarly interesting, because it seemed at the same time to indicate, that if that could be ascertained, it would discover what was the food of animals; for all the animals that live upon the earth or in the air, are known, in general, to derive their subsistence either from vegetable food directly, by consuming vegetable substances themselves, or indirectly, by using the flesh of other animals which have ultimately derived their subsistence from vegetables. Hence it is, that we have invariably inferred, that even those animals which we call carnivorous, even those which are so purely such as never to taste any kind of vegetable food whatever, are still ultimately supported by vegetables; so that the substance, whatever it be, which constitutes the food of plants, must ultimately constitute the food of terrestrial animals also: of course, the number of animals that can be subsisted on this globe can never exceed the quantity of vegetable matter that the earth can be made to produce for their subsistence, if the sea, and the food that can be drawn from thence, be put out of view.

But when we come to consider the sea, and other bodies of water that are accumulated on this earth, the same question occurs, though it afsumes a very

different shape. That there are vegetables in the sea, and in fresh waters every where, there can be no doubt; and that these vegetables may furnish food for particular animals, will not be denied; but it will be at the same time admitted, that the number of fishes, properly so called, that live chiefly upon vegetable matter are very few; and if there be any that live entirely upon it they are not known by me. Fishes, by most naturalists, are conceived to be usually carnivorous, though many of them are not so entirely such, as not to consume certain kinds of vegetable matters when they come within their reach: and, although most fishes eat flies and terrestrial worms when they come in their way; yet the quantities of fishes that swarm in the immeasurable waste of waters that surround this globe are so immense, that the subsistence which they could derive from these sources appears to be so small as to be altogether disproportioned to their wants. In short, fishes of a smaller size seem to constitute the principal food of nearly all the fishes that we know. But the question still recurs here, as in regard to vegetables, What is it that constitutes the food of these small fry on which the larger subsist? For, if these are in the continual act of being consumed, as vegetables are by animals, they themselves must draw their subsistence from something that is not of an organised nature, as vegetables do. What then is this?

That vegetables extract from water the unorganised matter, whatever it may be, that by the vegetative procefs is converted into vegetable substances, is universally admitted by all who have adverted to this sub-

ject; and that fishes, under certain circumstances at least, extract from water also an unorganised matter, which, by an animal procefs equally unknown to us as the vegetable procefs above alluded to, is converted into an animal substance, it seems scarcely pofsible to deny. This may, indeed, appear at first sight, to those who have not adverted to subjects of this sort, a very untenable position; but why? Merely because such persons have been accustomed to believe, that nothing but palpably solid substances can furnish a suitable subsistence for animals of any kind. They have been accustomed to see the creatures with which they are acquainted invariably stand in need of solid substances for food; and they thence conclude, that nothing else can yield this subsistence. But if vegetable solids derive their origin from unorganised fluids by the vegetative procefs, what greater wonder would it be if an unorganised body, in a state of fluidity, should be converted into an animal substance by the animal procefs? Indeed, we can as little conceive an idea of the manner in which an organised vegetable should, by the animal procefs, be converted into an animal substance, as we can conceive the other;—we only know that the last is so, because we see it done every day of our lives. We see more: we see that the very same vegetable is not only converted into animal substance in general, but into a variety of particular animal substances, each extremely different in form and other qualities, without our being able to form the most distant conjecture how these things should be. The same kind of grafs, for example, given to a pig, a calf, a lamb, a foal, and a gosling,

will be capable of furnishing alone subsistence to them all, till each of them attains a state of maturity; and it is now found, that it has been, by the animal proceſs, changed from graſs into the various substances of flesh, skin, hair, wool, feathers, excrements, &c. which constitute the distinct animals of a boar, bull, ram, horse, and goose, each perfectly distinct from the other in all its peculiarities, and capable of continuing its kind distinct for ever, though they should all be subsisted upon the very same food to the end of time. That these things are so, we know; but why they are so, we know not, any more than the animals themselves do, whose natural organs perform, unknown to them, the functions that are neceſsary for producing these changes.

Let us, then, be no longer disposed to deny that fishes may be naturally endowed with the faculty of converting unorganised matter, that may at this moment subsist under a fluid form, into solid animal substances, because we cannot tell how this should be. We, in fact, know nothing of the economy of nature; we are only capable of observing a few of the visible effects of that economy, and the phenomena that result from these in certain circumstances. We know well, that a leech may be preserved alive and in health for a great length of time in common water, and that it will increase in size, and be capable of exercising all its animal functions in that state. It would be hard to deny that the leech had in this instance derived nourishment from the fluid alone, in which it lives, though it is at the same time well known that it greedily sucks up another fluid of animal origin when

it can have access to that, from which we cannot doubt but it derives nourishment. In like manner the gold and silver fishes from China may be kept in a vessel of pure water for an indefinite length of time, without any other food than what they derive from that element; and during this period augment in size, and develope all their natural peculiarities; though they will greedily devour crumbs of bread, or various other kinds of food, if these chance to be thrown to them.

From these, and many other similar facts that might be stated, I can see no reason to doubt that fishes in general are endowed, by the economy of their natural organization, with the faculty of deriving sustenance from mere water, in the same manner as terrestrial animals are endowed with the faculty of deriving sustenance from vegetables; and though, in both cases, there may be some kinds which cannot be at all subsisted upon this original *pabulum* in its native state (those that are purely carnivorous), and many that admit of taking that *pabulum* partly in its native and partly in its prepared state (as man), yet that in both cases this original pabulum must be considered as constituting, either directly or indirectly, the food of the whole; so that the flesh of all terrestrial animals may be considered as being produced from vegetable matter changed by the animal process into its present state. In like manner the flesh of all fishes may be considered as being water (or some diaphanous matter administered through the medium of water), converted by the animal economy into the flesh of fishes; and also that vegetable substances derive their nourishment from something administered

to them in a similar manner through the medium of water.

To such persons as have never turned their minds toward disquisitions of this sort, it may appear, perhaps, a little difficult to admit that it is pofsible for a thin diaphanous fluid to be by any procefs of nature converted into an opaque solid body of any kind, whether of a vegetable or animal nature; but their wonder in this case arises merely from their not having been in the habit of observing the phenomena of nature with a sufficient degree of attention; for such changes of fluid into solid bodies are extremely common. Ice, no one will deny, is a solid body, that we all know was a fluid in the usual state of our atmosphere. Both the solid and the fluid are in this case, it is true, diaphanous; so that we think the change is very inconsiderable. Tallow, when melted, is also a fluid, that is, in a great measure, diaphanous; but when it is allowed to cool it becomes a solid opaque body. Those substances called metals are solid in the usual temperature in which we live, but may be converted into fluids by a mere change of temperature. Even all these substances may be rendered elastic fluids, so as under certain circumstances to become invisible, and elude our senses.

In the above instances we see, that by natural procefses, which are every moment pafsing around us, diaphanous, elastic, imperceptible fluids are undergoing changes which render them solid, opaque, and ponderous bodies; and which, as being common, appear to us in no respect surprising. Why, then, should similar changes by the ministration of other natural

operations appear in our eyes surprising? Merely because we have not been in the habit of adverting to them.

Fluids are converted into solids by many other proceſses with which we are familiar, without any change of temperature, as happens to be the case in all the instances above adduced. All saline crystals contain water, not in a frozen state congealed by cold, but as a body, in the producing of which heat is often employed as a powerful agent. Common salt, and nitre are of this number; water, in both cases, constituting a very considerable portion of the whole maſs. These salts are transparent, though a considerable portion of the constituent matter of which they consist is a solid opaque substance. Green vitriol (copperas) is in like manner a salt whose basis is iron, and allum a crystal whose basis is clay, both opaque substances, as every one knows, along with which a great proportion of water is combined, the whole constituting a solid diaphanous body.

In these instances we see that opaque solid bodies become divested of their opacity, though they still retain their solid state; but the instances in which bodies lose at the same time their opacity and solidity, and become transparent fluids, are numerous; and so familiar to us, that we take no notice of them. Sugar, a solid opaque body, we every day diſsolve in water, when it disappears without disturbing the transparency of the fluid. Metals are in like manner diſsolved in acids; and chalk, by a similar proceſs, loses its earthy form, and is changed into a fluid of crystalline purity. Into this transparent fluid let fall

a drop of another fluid equally transparent (sulphuric acid), and the chalk instantly assumes its solid form, falling to the bottom in a white opaque mass. Thus are solids and fluids, opacity and transparency, mutually convertible into each other by processes that are quite common.

These are familiar illustrations merely calculated to free from ridicule, in the minds of such of my readers as have not been in the habit of reflecting on things of this nature, the proposition announced. In none of these instances are *permanently elastic fluids,* which only of late have been suspected to enter as constituent parts into the composition of solid bodies, taken into the account. The modifications of which these light and invisible substances are susceptible, and the changes which they can be made to undergo by their various combinations with each other, are such as to appear altogether inconceivable by men who have been accustomed to overlook all substances that are not visible or tangible, or perceptible by the common application of our senses. In consequence of late discoveries, however, nothing is now less surprising than to see a solid weighty body produced, as it were, from nothing; that is, from the combination of two or more fluids that are perhaps not at all cognisable by our senses. Water itself is known to be a combination of that sort, which may be either made or destroyed at pleasure. That inanimate objects extract from the atmosphere alone, in some cases, an elastic invisible fluid which becomes fixed, and furnishes a considerable portion of the solid body itself, was proved above thirty years ago by a set of judicious experiments con-

ducted by the ingenious Dr. Black, late of Edinburgh, which showed by the most incontestable evidence that nearly one third part of marble or chalk in their natural state consists of such an elastic fluid thus fixed, to which at that time he gave the name of *fixed air.* The same substance, now called carbonic acid gas, is known at this time to enter as a constituent part into the composition of many other substances, and to be an active agent both in the animal and vegetable processes. From a multiplicity of experiments upon this and a variety of other aëriform fluids, there is no reason to doubt, that most of the substances with which we are acquainted consist of nothing else than these aëriform fluids fixed by certain processes of nature, (which can indeed, *on some* occasions, be imitated by us) and variously combined, so as to assume the appearances which they now exhibit to our senses.

Since, then, we find, that by the agency of the elements alone mere aëriform fluids, which, in the eyes of the multitude, are deemed nothing, can be converted into solid substances of a variety of kinds, why should we be startled at believing, that by the vegetable and animal processes the same imperceptible substances should be capable of being converted into the animal and vegetable matters that we see? This gives a striking view of the wonderful simplicity of that economy of nature which, the more we know of it, the more it must excite our admiration of the supreme First Cause whose fiat alone could constitute a universe which, under an infinity of never-ceasing changes, continues for ever the same. All animal and vegetable substances are ultimately resolved into

aëriform fluids, which, when thus disengaged, become anew the source of new existences of the same sort.

Although I conclude then that fishes, perhaps of every sort, derive *some* part of their sustenance from water itself, yet there seems to be no reason to doubt that some sorts derive a much greater proportion of their food from it than others do. Of all the swimming fishes known to man as an article of food, I conceive that no one subsists so entirely on water as the herring. There is little reason indeed, as I think, to doubt but that herrings derive their subsistence from water, nearly as much so as vegetables in general do. The herring, it is known, is a fish of such a strong gregarious tendency, that it is always found in schoales; and on many occasions the herrings in these schoales are crowded so close together as to fill the whole sea from top to bottom, or at least so far as our implements can reach, so as to thicken the water with their bodies. Ships are said to have been retarded in their course in paſsing through these schoales; and on many occasions the herrings may be laded up in buckets in great quantities: frequent instances have also been known, where these little fishes have been left by the ebbing of the tide in heaps three feet deep upon the shores for many miles in extent at one time. Nor is it only upon rare occasions that such quantities of these fishes are collected together; they are seldom seen but in compacted schoales of this kind; and it is universally believed among those who are versant in this kind of fishery, that no other kind will voluntarily go into the middle of such a schoale. The whale, who preys upon them as his favourite food,

and who will lick up, perhaps, a thousand at a mouthful, never allows himself to get into the schoale, but hovers about the skirts of it only, following their course wherever they go. The same thing is remarkable of the dog-fish, a species of shark of a voracious kind, which in great multitudes follow the herrings afsiduously, but carefully keep aloof from the main body of them: so it is with regard to the cod and ling, all of which delight in the herring as a prey, but seem to dread their multitudes as a body.

That herrings derive the whole of their subsistence directly from water, in which they swim, seems to be confirmed by a multitude of facts respecting the habits and economy of that singular and deservedly celebrated little animal. Though they always swim in schoales of immense magnitude, which cannot be likened to any other phenomenon in nature with which we are acquainted, unlefs it be those destructive swarms of locusts which have been sometimes known to fill the air in certain regions of the globe so as even to obscure the sight of the sun, and cover with their bodies every terrestrial object they meet with in their course; yet, unlefs it be with respect to *numbers*, we can find no other resemblance between the schoales of herrings and the locusts. These insects proceed in their course evidently in search of food alone. The foremost of this multitude seize upon the first vegetables that come in their way, and devour it, leaving those that follow to perish for want of food. Their course is marked by destruction; nothing is left behind to support animal existence. If the wind should chance then to shift, so as to drive them back in the same

track through which they came, their subsistence being exhausted, they all perish: they are therefore in a continued state of progreſsion; and to rest in one place for a few days, or to return in their former path, are alike inevitable destruction to them: not so with the herrings. They advance sometimes with great rapidity, and sometimes more slowly: at times they recede, then perhaps advance in their former course; often they remain stationary in one place for whole months together. Neither do these motions appear to be in any degree influenced by the nature of their food; nor have any symptoms ever been discovered that their food has been diminished in consequence of their long continuance in one place. No circumstance respecting their migrations has ever been observed to have the smallest connexion with their condition in regard to fatneſs, or the reverse. When they are in a progreſs, let it be continued ever so long, the foremost fishes in the schoale have not been observed to be in better condition than those in the rear, which must have been the case had they preyed on small fry, or drawn their subsistence from any other solid substances that floated in the water; neither has it been observed that they generally get leaner after they have remained long in one place; which must have been the case had they subsisted on the solid substances contained in the water, which in that case must have been quickly devoured. That a body of herrings, however, is sometimes found, the individuals of which are in general much fatter or leaner, larger or smaller than others, is certain; but if these two different sorts are found in the same place, it as often

happens that the fat fish follow the lean, as the reverse. There is, in short, no connexion observable between these two circumstances; so that no known fact seems to give the smallest indication that ever the quantity of food has been in any respect exhausted or even diminished by the numbers or long continuance of this fish in one station. All these facts seem decisively to indicate that this creature is capable of drawing its subsistence from the water itself by an inherent power of its animal functions, of converting sea water, or the elements of which it consists, into its own substance, which nutrimentitious matter it would seem always to find in abundance wherever that water exists.

This reasoning is strongly confirmed by the facts observable respecting its condition when the body of this little fish is examined. Wherever a herring has been caught, or under whatever circumstances it has been killed, if it be in good health, and consequently fat and in good condition, nothing is ever found in its stomach that gives the smallest indication that it has been either of vegetable or animal origin. The only contents of the stomach is a very small quantity of a mucous matter of a slimy nature *sui generis*, that has no parallel that I know of in the world. Under the influence of one peculiar disease indeed, when the fish is in a state of exhaustion that renders it totally unfit for any of the purposes for which the herring is ever caught by man, some vestiges of small fishes are found in its stomach, as is usual with other fish; but this false appetite has evidently been the consequence of disease, as it is never observed but under these cir-

cumstances. It seems to be produced in the same manner as the desire to eat pieces of mortar or lime rubbish is found irresistibly to prevail among some children when they are distreſsed by that disease which is occasioned by worms in the body.

From all these facts combined, it would seem that it had been intended by nature, that the herring should be endowed with the faculty of deriving its nourishment directly from water, nearly in the same manner as vegetables derive their subsistence from the same element in the soil, in order that an abundant sustenance might thus be furnished to other fishes that are of a nature more strictly carnivorous than it is. That other fishes, especially those which multiply very fast, may be endowed with a similar faculty in a greater or leſser degree, seems to be extremely probable; by means of which the water becomes capable of nourishing immense multitudes of fishes, which, were we able to examine it at all depths, might probably be found to support a much greater proportion of animal matter, than the land itself, with all the plants that grow upon it, are capable of subsisting.

[*To be continued.*]

To the Editor of Recreations in Agriculture, &c.

SIR, December 19, 1801.

I HAVE seen in the newspapers of this week an account of the proceedings of a society formed, as it is said, for the purpose of improving the breed of cattle in this kingdom, of which the duke of Bedford and several other eminent agricultural characters are

members. It appears that several oxen, fed so as to produce the greatest posſible quantity of fat, were produced at this their last annual meeting, and were publicly shewn in Smithfield market, to the delight and admiration of the surrounding spectators. After public curiosity had been satiated, these beasts were examined by the persons appointed to that office, and the various prizes apportioned according to the deserts of the competitors; and the subjects of these were then sold to be killed. As I profeſs myself very much at a loſs to find out what it is in this proceſs by which the country can be benefited, or any really useful purpose attained, I shall feel greatly obliged by your, sir, or any of your correspondents, disclosing the secret, and thereby enlightening my mind, so that it may arrive at the requisite perfection, to join in the gratitude which appears to be pretty generally felt for the members of this society on account of *their arduous exertions and very beneficial plans.*

A gentleman, whose veracity and accuracy I have no reason to doubt, informed me that he went to the slaughter-house to view the largest of these oxen after it was killed, and upon paying one shilling he was admitted to the honour. There were a great number of people present, who of course made various comments on the occasion, according to their several conceptions and opinions; but all that my friend was able to see, more than is commonly to be seen in such objects, was the prodigious thickneſs of the fat, which, in the places where it is usually about an inch and a half in thickneſs, was in this beast nearly a foot, and so on in proportion; and, in short, the creature was almost

a mere lump of fat. Now, sir, how society can be benefited by such an exhibition and by such measures, seems very difficult to tell. That the quantity of human food was increased, I very much doubt; and that this should always be considered the most important object in every experiment or improvement, will not be denied. It is well known, that the superabundant fat is sold by the butchers to the candle-makers, or to some other persons, who use it in a manner totally unconnected with human sustenance. I would therefore ask, sir, if it is thought that candles will burn better from being made of this precious stuff; or the other purposes to which tallow is applied, be better performed than usual; and even if the fact were so, would that be a sufficient compensation for the time, expence, and loſs to society, which must neceſsarily be sustained before the degree of perfection can be accomplished which is wished for and aimed at by those who enter into the views of the gentlemen concerned in this aſsociation.

Some person is reported to have said that one of the oxen produced at the meeting was well worth 100l. to breed from; and, though this remark was not very creditable to the gentleman's accuracy of observation, yet that very inaccuracy is a pointed reflection upon the execution of the plans of this society. If the breed of cattle is intended to be improved, how can that purpose be answered by paying such attention to an animal rendered incapable of continuing its kind? But indeed, sir, the more I think on this subject, the greater my difficulties appear, and therefore I shall postpone any further consideration of it until I am favoured with

the elucidations of yourself or your correspondents, and I have only to request that they may be given as early as posſible, to relieve me from my present uncertainty. I am, sir, your most obedient servant,

DUBIUS.

That all the good expected to be derived from any experiment will actually result from it, the daily experience of mankind plainly negatives; and that the best intended plan of improvement may, when it is attempted to be carried into execution, give rise to speculations that may lead to hurtful exertions, is but too clearly evinced by innumerable facts that daily occur: no just blame can therefore attach to the first promoters of an institution that had an apparently beneficial tendency, although it should be in time discovered that it has given rise to useleſs, or even hurtful speculations. All that wisdom, directed by beneficence, could require, would be, that as soon as this hurtful tendency shall be perceived, the exertions which paved the way for these pernicious speculations ought either to be abandoned, or so modified as to guard against the growing evil. The institution of which my correspondent complains was, no doubt, originally intended to ascertain, by fair and accurate trial, the comparative facility with which the different varieties of each kind of domestic animals could be fattened so as to render them proper for the butcher; and who will deny that if this point were fairly ascertained, it might be productive of considerable benefit to society? It will, however, be admitted by every considerate mind, that any attempt of this sort will

be attended with no inconsiderable difficulty. When the mind engages eagerly in any pursuit, it is ever liable to overstep the bounds that prudence might suggest; where its energies are excited by competition especially, it is next to impoſsible to prevent it from running into exceſs. This, I think, might be admitted as a sufficient apology for the gentlemen who have been subjected to the animadversions of *Dubius* for all that has been yet done, even supposing it should be admitted that they had run into some exceſs; but, if that exceſs should now be satisfactorily proved, it could not be so fairly adduced in defence of their persisting in an error.

For my own part, I feel much inclined to concur with the opinion of my correspondent; for, though no one can say that some good, which we do not at present perceive, may yet result from a knowledge of the simple fact that it is *possible* to fatten beasts to the degree that has been exhibited; yet, until these benefits can be perceived, it would seem to be enough to have ascertained that fact; and I cannot help conceiving that the attempt to stimulate to still farther exertions in that line would be more entitled to censure than applause. That the taste of man may be so far perverted as to be brought in time to relish certain kinds of food which he naturally would nauseate, is too clearly ascertained to admit of doubt; so that, although few people in this country at present can bear the idea of eating such unmixed fat as is above described, a time might come when they would prize it as a delicacy as great as the Ruſsian sailors, not long ago upon our coasts, did a draught of whale

oil, which, it is well known, they searched for with avidity; but I cannot conceive what good could result to the community from introducing this taste among the people, though I can easily see that much evil would be thus produced. And I am afraid that the public at present suffers in some degree from an approximation to this taste for viands among the people.

I conceive it to be extremely difficult, if not impossible, to fatten animals till they have nearly attained the corpulency in question without the aid of corn; and it is undeniable, that corn thus applied cannot be made to contribute half so much to the sustenance of man as if it had been directly applied to his own use in food: and I have no doubt but a considerable part of the deficiency of grain that has lately been experienced in this country, originates in the practice that has now become so prevalent, of fattening beasts on grain; a practice necessarily connected with the taste of requiring over-fed meat for food: nor let it be objected, that the corn on which beasts are usually fattened is not that sort which is generally eaten by man; for, if the farmer derives superior profit by rearing the first, the proportion he rears of the last will of course be diminished. The more this taste, then, is cherished, the more must this malady increase; it ought therefore to be the study of every well-wisher of the community not so much to supply fresh fuel to the flame, as to withdraw it.

Should it even be alledged that these beasts may be rendered thus fat without grain (a fact that it would be easier to assert than to prove) it would not remove

the objection. There can be no doubt that much more food, whatever it be, is required to over-fatten a beast of any sort than would bring that same beast into good condition; the more, therefore, that the taste for excefsive fat meat is cherished, the smaller quantity of that meat can be brought to market from the consumption of an equal quantity of grafs, or other food for beasts, so that the quantity of human sustenance that can be drawn from the same fields must be thus diminished. Under this point of view, then, not to mention the higher price at which such meat must be sold, the practice that would seem to be recommended by these experiments is hurtful, and calls for reprehension rather than support.

I have hitherto considered this question under its most favourable point of view, because I am by no means desirous of ascribing unworthy motives to the actions of any man, and far lefs so to those of any body of men who afsociate themselves for an object that has public utility avowedly for its basis. It seldom happens in such cases that a great majority of such afsociates are not actuated by the purest motives; though it perhaps still seldomer happens that there are not among them certain individuals whose principal object is self-interest and personal aggrandisement, who make use of the influence of others under the fairest pretexts to forward their interested plans. That a great spirit of gambling respecting different breeds of domestic animals has prevailed in this country for many years past, cannot be denied. This was first introduced by a man of great talents, for whom every person who is capable of appreciating these talents

must bear the greatest respect; yet, unfortunately for himself, as I am inclined to believe, as well as for the general interests of his country, he devised a plan for availing himself of the weakneſs of others to benefit himself, which has been gradually matured into a system of what I have no hesitation to call gambling, because it consists in a trafficking in an article, the price of which depends more upon imagination than its intrinsic value; to keep up the price of which there can be no doubt that every art that a fertile imagination can devise will be willingly adopted. Every person who deals in that article knows, as the persons in Holland during the *tulipamania*, who scrupled not to pay a thousand guilders for a tulip root, or those who, in the year 1720, paid without hesitation a thousand *per cent.* for South sea stock, that the intrinsic value of what they bought was greatly below what they had paid for it, so that they never could hope to live by the permanent traffic in the ordinary way of fair trade in these articles; but they merely trusted that the madneſs of the people would continue so long as to enable them to dispose of these extravagant articles to some one who was eager to obtain them, in hopes, like himself, to make a similar profit from the cupidity of others. When such a system is once introduced no one can say how far it may go, or where it will end: but no one is so simple as not to know that it must end somewhere, and that those who have been great adventurers must be ultimately sufferers by it; so that it is strongly the interest of every such person to keep up the bubble, and to prevent it from breaking as long as poſsible: nor is it easy for an unconcerned

spectator to conceive what will be the arts that ingenuity, thus put upon the stretch, may devise for propping up the tottering fabric. For such devices, however ingenious they may be, I can have no predilection: on the contrary, I look upon them with contempt and execration. That the premiums which gave rise to this discussion have been suggested by concealed ideas of this sort, I can neither take upon me to assert nor to deny. That the relation between the objects of both these speculations is such as to give no unfounded pretext of surmises of this kind among suspicious minds, cannot be denied; to remove which, and every other injurious insinuation, I cannot but highly applaud the wisdom which suggested the hint that dropped from the noble president of the late meeting, viz. that if the promoters of that association should find that the objects of that institution seem not to be approved by the public, it was intended to be discontinued. What could more clearly indicate a candid ingenuousness of mind than such a declaration?

Remarks suggested by the perusal of the pamphlet called An Inquiry into the Influence of Tythes upon Agriculture, &c. By the Rev. Mr. Howlett, just published.

AMONG the letters I have lately received there are no less than three of my correspondents who have recommended the above-named pamphlet to my notice, of which I shall only transcribe one. It runs thus. "Sir, though I have read many of your Recreations

with much satisfaction, this has not been the case with the whole. The strictures on tythes in particular, which have occurred in several late Numbers of your work, have appeared to me harsh, if not unfounded, in many respects; and do not, I think, indicate that liberality of mind which is conspicuous in most of your other writings; which makes me suspect that you have imbibed prejudices respecting that subject that I wish to see removed. With that view, I beg leave to recommend to your careful perusal a pamphlet just published by the Rev. Mr. John Howlett, vicar of Great Dunmow, Eſsex, on the subject of tythes, which I hope will have the effect of bringing you to a right way of thinking on that head. If you do this it will much oblige your very humble servant, *Clericus, junior.*" The other two letters are signed *Rusticus* and *Cato*, whose motives for recommending this pamphlet to my notice are of a nature quite the reverse to those above stated. As it is my desire at all times to comply with the wishes of my readers, where that can be properly done, I have accordingly perused the pamphlet above recommended with the attention it required; and, as it treats of a subject that I deem of too much importance to the community at large to admit of being treated lightly, I shall, with great candour, submit to the public a few observations that have been suggested by the perusal of it.

The first was the general impreſsion it left upon my mind after the perusal of the whole, which was that of disappointment and disgust. I sat down with the expectation of meeting with a train of sober serious arguments, that were directly applicable to the point

in question throughout the whole, with an intention to appreciate their tendency with accuracy, and to allow each of them to have its full weight upon my mind, whatever that tendency might be. Thus seriously disposed myself, I could not help feeling a most unpleasing regret at proceeding from page to page without being able to meet with what I looked for, until at last I had waded through the whole, consisting of 120 pages, without finding, in as far as I can recollect, a single argument, candidly and fairly stated, that applies unequivocally and directly to the real merits of the case in question. Posibly this blindnes in me may have been occasioned by the "prejudices that *Clericus, jun.* thinks I have imbibed;" to remove which, if so, I will thank Clericus, jun. or any other person who will take the trouble, to point out any passage which answers the description above given, and I shall then bestow upon it all the attention it deserves. I may, however, be allowed to except one or two passages that occur on the subject of commutation, which, though just when considered by themselves, will be found to militate directly against the general positions the author has endeavoured to inculcate. The title of the pamphlet, then, appears to me to be entirely a misnomer. It ought to have been called an *apology for tythes, more especially clerical tythes,* in which case my disappointment would have been entirely obviated. I should have expected then what I did meet with, and should not have been inclined to withhold from it the praise of an able apology; in respect to ingenuity at least it would have merited applause.

In concluding, Mr. Howlett states, that "the ge-

neral result of the preceding disquisitions is, *that tythes, of whatever denomination, and however taken, have not been, nor are ever likely to be, any material obstacle to the improvement of agriculture.*" These words, to avoid danger of misrepresentation, I have fairly transcribed from the 38th page of his work. They are, in effect, repeated again and again in various parts of that performance. It will, however, be allowed, that a position that is so directly contradictory to the experience and common sense of mankind at large, would require to be established by the most undeniable arguments, grounded on decisive facts that were clearly indisputable, before it would be admitted. But this is a task which Mr. H. would seem to think was too arduous for him to attempt; he has therefore waved it: and, that it may be lost sight of by his readers, he brings forward a variety of cases and distinctions, that tend only to lead the mind from the main question in pursuit of things that have no direct influence upon it; such as, that of tythes payable by the land proprietor to the lay impropriator: by the land proprietor to the clergyman: to the lay impropriator by the farmer: by the farmer to the clergyman, and so on. The question surely is not here, to whom or by whom tythes are paid; but, simply, whether tythes paid by any one man to any other man tend to become an obstacle to the improvement of agriculture? Had this point been fairly discufsed, without attending to the nature of the persons who may chance to be concerned, whether clergy or laity, land-owners or farmers, I should have considered the pamphlet as answerable to its title. This point being

once discuſsed, the interests of the different persons concerned, in as far as they are connected with tythe, would have merited due consideration; but, to bring them forward thus at the beginning of an important inquiry, where human paſsions and personal interests may, if excited, have such a tendency to mislead the judgment, is obviously calculated to frustrate the intent of the inquiry, by an accumulation of irritating remarks and provoking injuries, that must in the most direct manner tend to frustrate every attempt at calm discuſsion. Sorry I am indeed, exceeding sorry, to find that a clergyman of respectable character, as I am inclined to believe, and of talents of a superior kind, should not have been more upon his guard against the fascinating influence of that *esprit du corps* (a French phrase, for which we have nothing equivalent in English), which has so evidently misled him throughout the whole of this discuſsion.

The phrase *esprit du corps* denotes that partial kindneſs which every individual naturally feels for any select body of men with whom he is connected, whose general pursuits and objects of desirable attainment are upon the whole of a kind similar to his own. In this sense, a mercantile man feels a natural tendency to promote the mercantile interest; a landed-man to promote the landed interest; a clergyman the interest of the clergy; and an Englishman the interests of England. This is a natural propensity, which, when kept within proper bounds, like every other impulse of nature, is productive of good; but when carried to exceſs, it is the source of great and manifest evils; and has been the cause of perhaps more distreſs to mankind

than any other that can be named. The principle is invariably the same in all cases; viz. a secret impreſsion upon the mind, that whatever shall promote the general prosperity of that particular claſs or guild, of which we form a constituent part, will augment in one way or other the interest of each individual belonging to it. This secret hankering operates, though often unobserved by themselves, upon the minds of all mankind, and produces a wonderful influence upon human conduct.

When we come to inquire into the causes which operate in this manner so universally, it is not difficult to discover them, and to perceive at the same time that, were they to be suspended, the social order would be entirely annihilated, and universal confusion introduced into the universe. When the first faculties of the mind begin to open, every human being finds itself surrounded by those who minister to its wants and afford it protection. A reciprocal kindneſs for those who are kind to it is, perhaps, the first emotion of the infant mind. To that person it clings for protection on every imagined danger. The ideas communicated are all of the social kind. Love and confidence in acquaintance, when compared with strangers, is an early sensation; this gradually extends to neighbours, acquaintance, country. The whole human race share at length in our affections; but our country in a supereminent degree. And why? Because we know those that are near to us, and see that they are good, while others that we know not are represented to our minds as bad and destructive. We feel that our personal protection depends upon the power

of the first, to oppose the machinations of the last, whose efforts are continually exerted, as we think, to injure us. Hence the source of family concord and love of our country.

The same propensity follows us in every occupation of life. To whatever business we attach ourselves, we apply our attention in a more decided way to it than to any other; and we, of course, soon acquire a knowledge of the circumstances that tend to affect that profession in an especial degree. Our attention is constantly kept awake concerning these, while those circumstances which affect other bodies of men are comparatively disregarded. We thus come at last to see and to feel every circumstance that affects that body with a peculiar degree of sensibility, and naturally endeavour to augment the good and diminish the evils affecting that community more than others. We feel not the interest of others so strongly; and this arises not from any wilful perversity of mind, but from a natural and unavoidable concatenation of causes. Our ignorance of, and consequent inattention to the circumstances that affect others, produce this *esprit du corps*; and it may, undoubtedly, exist in a very strong degree, as connected with the best dispositions of mind, as well as the most distinguished talents: let us not then accuse those of malevolence or disingenuousness, whom we see accidentally deviating from this path; but rather bear with them with patience, and, by a gentle demeanour and conciliating conduct, endeavour to draw them from the path of error. They may then become the firmest supports of truth.

Such are the sensations that I feel on the present

occasion; and I have scarcely a doubt that the ingenuous gentleman to whom these observations refer, will not only not be offended at what shall follow, but perhaps may thank me for the kindneſs that I mean to do him. As a farther apology for the *manner* in which the present argument has been conducted by him, I may be permitted to remark, that Mr. H. early in life was engaged in some literary controversies of a political nature; in the conducting of which he would naturally avail himself of every argument that would seem to support his cause; for *victory* in these cases is generally accounted of great importance; and a habit once got cannot be easily abandoned.

Mr. Howlett however, sensible, as it would seem, that the world would in general be inclined to believe that a clergyman writing upon the subject of tythes might be suspected of having an undue bias in favour of the clergy, endeavours to obviate that by declaring at the commencement of the pamphlet, with great seriousneſs, that his own personal interest can be in no respect affected by the discuſsion. This ought to be admitted as sufficient evidence, that his observations, whatever may be their tendency, have not been dictated by the paltry consideration of personal aggrandisement; though it by no means removes the probability that his mind may have been swayed, though perhaps unobserved by himself, by those partial views which a long habit of thinking in a particular train may have induced. I too, who have written perhaps with as much earnestneſs as any one on the subject of tythe, and who have all my life been a constituent member of that body of the community

whose funds are vested in land and agricultural produce, may with equal justice be suspected of a partial bias in favour of the body of men with whom I have been associated; and therefore I think it right that my readers should be warned of this circumstance, in order that they may be upon the watch to guard against any fallacious argument that may, perhaps, unperceived by me, be adduced in the course of this discussion: for, although it be a truth, that I myself never was chargeable with one shilling for tythe, in the sense wherein that word is always used in this disquisition, nor have the most distant prospect of being in future affected by it, so that the personal interest of no individual in the kingdom can be less involved in the discussion than my own; yet I am far from wishing that that circumstance should alone be considered as a sufficient guard against partiality on my part. A high authority has said, "it is not by their professions but by their deeds that men can be known." All I desire is, that the arguments on either side be fairly weighed, and rejected in every case where they shall be found defective: truth will thus be finally triumphant, which is the only object of my solicitude.

With regard to one particular, it is pretty evident that the mind of Mr. H. himself has been influenced by a false impression, which he has assiduously endeavoured to communicate to his readers throughout the whole of his pamphlet. He supposes that one great object of those who disapprove of tythes is, to degrade the clerical order by diminishing their income. For my own part, I can with great sincerity declare,

that this consideration never had the smallest influence on my own mind in considering the question: nor, in as far as I can perceive, has it operated on the mind of any other writer of respectability who has adopted this side of the question: on the contrary, I can with great truth aſsert, that in the plan of commutation for tythe which I proposed in the third volume of "Eſsays on Agriculture," one of its chief recommendations in my own estimation was, that it would have a direct tendency to augment the income of the most worthy part of the clergy to nearly double its present amount, while it would free them from perplexities which they ought not to feel, which only tend to diminish their own comforts, and to place them in a situation that but too powerfully tends to frustrate what ought to be with all, and what is I know with many, the warmest object of their wishes. Were I myself a member of that learned body, I do not know an object that I should so sincerely deplore, as that political regulation which established a neceſsary connexion between the amount of my living and that of tythe; nor could any thing afford me more consolation than the prospect of ever having these disjoined. This I should have said as a clergyman; and by the same principle I was actuated upon that occasion. As a *farmer*, I was fully sensible at that time that the immediate income of that body of men would have been thus diminished, though nothing like so much as that of the clergy would have been augmented: but this sacrifice on their side might soon have been abundantly compensated by their own industry, if they chose to exert themselves. Ultimately,

indeed, I do not consider it as a material object either to the farmer or the country at large, what the proportion payable as tythe is; so as it be but fixed. It may, indeed, affect landed gentlemen; but it would be easy to show that no proportion which reasonable men could ever be brought to pronounce equitable, could ever ultimately prove injurious to them. On these principles, then, the plan I proposed, though it was calculated to prove in the end beneficial to the whole community; yet it was in an eminent degree more directly beneficial to the tythe owner, and consequently to the clergy, than any other order of men. This surely indicates no malice on my part to that body of men. Indeed, it has been always my opinion (often before as publicly expreſsed as now), that the welfare of society depends more upon the influence of a respectable clergy than on that of any other body of men whatever; and one of my principal objections to tythe is, that it tends so powerfully to diminish that influence among the people. I consider, therefore, the frequent recurrence of Mr. H. to this subject in his pamphlet in the manner he has done it, as unfounded, illiberal, and well calculated to excite irritating discuſsions that ought to be carefully avoided. Wishing to wave, if poſsible, all such discuſsions, I shall now proceed to adduce a few observations that will tend to controvert the general inference above stated which Mr. H. has deduced from his investigations.

I have already adduced, in the course of this work and others, so many proofs (which I may be allowed to consider as valid till they be refuted), that the drawing of tythes in kind is a strong obstruction to agri-

cultural improvements, that I shall not enlarge upon that topic now, farther than barely to state one argument, which, if refuted, may be re-considered; but till then shall be deemed by me as conclusive: and I hereby declare, that if Mr. H. or any other person shall invalidate it by fair and unequivocal proofs, so as to enforce conviction, I shall publicly relinquish my error; or, if it shall produce any fair discuſsion, in which the parties, though not convinced, shall seem to be desirous, as I am, to attain the truth, I shall not hesitate to make such additional illustrations, if neceſsary, as shall seem calculated to lead to that end: but to captious observations, or sophistical subtleties calculated only to perplex, I shall pay no regard. In that line, I will contend with no man for victory: in search of truth, I will not shun the discuſsion with any man.

The argument in this case, when stated in its purest simplicity, appears to be of the most obvious nature. All agricultural improvements (by which I wish to be understood to mean every effort of man that tends to augment the produce of our fields), must be effected by labour or manures: but both labour and manure can only be obtained among us by the expenditure of money. This money must be the property of some one, who can be induced to apply it for these purposes only with the intention of deriving a benefit to himself from such application. The augmented produce, then, that he hopes to derive from such application of capital is the circumstance which alone induces him to make these exertions. The greater that produce is then, the greater will be his profits; and,

of course, his exertions will be stimulated by every circumstance that shall tend to add to the amount of that produce, as they will be slackened by any circumstance that tends to diminish its amount. To the truth of this proposition, when thus divested of every allusion to particular cases, no person in his senses can refuse his assent: but the tythe, which takes from this undertaker one tenth part of such produce, must diminish its total amount in the same proportion: his profits, therefore, must be exactly so much diminished. How then, I ask, is it possible to deny, that the exacting of tythe from land can operate otherwise in every possible case than as an obstacle to agriculture?

When the question is thus fairly stated, no man can, I think, refuse his unequivocal assent to the position. Whoever does otherwise must have recourse to subterfuges of various kinds, which it would be in no other respect difficult to unmask than as it would be an unpleasing waste of time. The pamphlet under consideration affords the most decisive evidences, repeatedly enounced, that its author acceded to the truth of the above proposition, however much he has departed from it in the concluding inference above stated. Thus (page 6) he writes, "If he (the agriculturist) has any particular improvements in prospect, which will be attended with considerable expence, his first inquiry is, will the profits be more than that expence *when increased by the full additional tythes?* If they will, he undertakes it without hesitation: if they will not, and the impropriator will abate nothing of his full claim, the purposed experiment (improvement) will of course be prevented." One must surely

be at a loſs to conceive upon what grounds the person who in this instance so justly states that the exaction of tythe will *totally prevent* an agricultural improvement, should conclude generally, "that tythes, of whatever denomination, and however taken, have not been, nor are ever likely to be, any material obstacle to the improvement of agriculture." I do not overlook the word *material* in the above quotation, though I am ashamed to take notice of the jesuitical use to which it might perhaps be intended to be applied. I hope, for the honour of the British clergy, that it was not so meant to be applied by our author. In that case, it might as well be struck out of the sentence by its author, as that would remove a handle for ill-natured remarks by snarling cavillers. This might be done with the better grace, seeing that it can prove of no service on the present occasion; for, aſsuredly, no one can hesitate to admit, that that which puts a *total bar* to an agricultural improvement is a *material* obstruction to it.

In the case above stated, the author had the lay impropriator in his view. In what follows he considers the tythes as belonging to a clergyman; in which the same case comes forward under another peculiarity that deserves notice. In the first case, though it was poſsible for the lay impropriator either to stop the improvement before it commenced, and thus to prevent the considerate improver from an obvious loſs of capital, or to make such an agreement respecting tythes as to permit him to go on; this security, however, Mr. H. justly observes, cannot be granted where a clergyman is owner of the tythes.

"Here, he candidly owns (p. 6) the case is somewhat altered; and there is one circumstance which seems to be *peculiarly* discouraging to agriculture; namely, that the clergyman can make no agreement with the land-owner that would bind a succeeding incumbent. Hence it may so happen, that the land-proprietor, from the fairneſs and candid indulgence of a clergyman, may make terms of ample encouragement to some expensive and capital improvement. But as soon as the improvement is completed, and before a farthing profit has resulted from it, the clergyman dies. His succeſsor, whether the *living has been purchased for him*, or given him by a patron, has a *legal* right to take a *tenth* of the increased produce, and which may, perhaps, be *more than the whole of the profits.*"—Is it poſsible to believe that the man who can state this fact can be seriously convinced "that tythe can in no case prove a material obstruction to agriculture?" He surely wrote at random, and without due consideration. Let not Mr. H. if he shall read this, conceive that I have overlooked, or intentionally suppreſsed, the observations that occur in the concluding part of this paragraph, and some that succeed it; but that I merely paſs them over as irrelevant, as I shall fully show hereafter, if other more important objects do not prevent it.

Mr. H. adduces the following fact (page 30) which he seems to think affords complete evidence that tythe does not prove obstructive to agricultural improvements.

"Annual average number of bags of hops, grown in this kingdom during the 21 years, ending with 1731 ..... } 36,527

21 years, ending with 1752.....50,752

Ditto, ending with 1773 65,799

Ditto, ending with 1794 .....77,195"

and concludes with this remark, that "if the highest tythes have not checked that kind of agriculture, the expence of which is greatest, is there common sense in the supposition that they have produced that effect where both tythe and expence are so much lefs?"

It would be easy for me, were I inclined to make flippant remarks, to ask, whether there be common sense in the supposition, that the same person who has so recently admitted (see p. 357) that tythe may, in cases of considerable expence, not only retard, but totally prevent agricultural improvements, should seriously believe that such a case can never happen; or, where a solitary fact occurs which seems to belie this conclusion, never to suspect that this seeming contradiction may have been occasioned by some unobserved circumstance of over-ruling influence? Had tythe been the *only* obstruction to improvements in this country, and had the withdrawing the demand for tythe been the *sole* encouragement that the nature of things admitted for the rearing of the particular crop in question, the conclusion above stated might have been admitted: but, seeing that this is far from being the case, the solitary fact thus stated, while many other circumstances that might have affected it are kept totally out of view, concludes nothing. So numerous indeed are the circumstances that might

have contributed to produce this effect, that it would be tiresome to detail the whole of them: the competition of foreigners in our own market may have been checked by protecting duties, or even annihilated by a total prohibition against its importation; as has, I am assured, actually taken place in respect to Flemish hops within the period mentioned: the general price of the article might have been thus, or otherwise, so much augmented within the period specified, as to have been more than sufficient to counterbalance the pressure of the tythe: in an article of such limited culture also, where the nation at large is considered, the tythe may be in many cases nothing; for it is well known that there is a great deal of land in Britain that is tythe free, upon which plantations of hops may have been made without being at all affected by the tythe; or the tythe, where it does actually take place, may have been so moderated as to prove no sensible obstruction in this case. Where a plantation of hops is in contemplation, we may naturally suppose that the undertaker will try to compound for the tythe before he makes his plantation; in which case, if the demand of the tythe-owner prove exorbitant, the undertaking will there stop; but, as one fourth part of the tythe of hops may, in this case, be more than the tythe-owner can draw from most other crops, he may perceive it to be his interest to encourage the undertaking in some instances, by accepting a composition little above that rate. In this way, in regard to an article so limited in its extent, and of such high profit occasionally, the culture may have been gradually augmented in a small degree in this country, in spite of its tythe laws; and

without invalidating in the smallest degree the general objections that lie against them. Even the illegal machinations of a *Waddington*, by enhancing the price of hops beyond their natural standard, may have contributed to encourage the farmer to make spirited exertions in this particular department, so as to counteract the influence of the tythe. Mr. H. himself, however, admits in the present pamphlet, that several hop grounds have been actually eradicated on account of tythe being rigorously demanded from them. In these cases, we may suppose that the original moderate composition that had been accepted by the tythe-owner, probably before the plantation was made, had been annulled by the death of the incumbent, whose succeſsor had rigidly persisted in his demand of full tythe, which the profits of the crop could not afford; in consequence of which they have been grubbed up. Thus may the avarice of one man extirpate a plantation, which might have continued profitable to the nation, while the prudence of another may give rise to a new plantation, probably of greater extent, which will be in like manner perhaps extirpated in its turn. Is there no common sense in the supposition, that tythes have checked this kind of agriculture, although other circumstances may in some cases have counteracted that baneful influence?

I confeſs myself, however, so much a stranger to the circumstances affecting hops and hop grounds, that, after these general and obvious remarks, I abandon that partial branch of agriculture for those of more general concern, viz. the rearing of corn and graſs, with which I am better acquainted, and re-

specting which I shall beg leave to bring forward a few facts which in a more decisive manner corroborate the general opinion of mankind, confirmed by Mr. H's. own remarks above quoted (p. 358).

With this view I subjoin a table, which affords the most undeniable evidence of the following very important facts; viz. *first*, that other circumstances besides tythe may have an effect in augmenting or diminishing the rearing of corn in this country; and that, of course, the amount of that augmentation or diminution, when taken as unconnected with other circumstances, cannot be admitted as fair evidence either for or against tythe. *Secondly*, that the produce of corn in this country, when compared with what it formerly was, has been prodigiously diminished of late years in proportion to the consumption of its people. *Thirdly*, that this diminution of produce has not been the consequence of two or three years of accidentally unfavourable seasons; but has been gradual, and uninterrupted in its progress, for the space of fifty years past; and, *lastly*, that the exertions of the farmer have not kept pace with the increased price of corn, but rather seemingly the reverse. These are important facts that demand the most serious discussion, and do not admit of being dismissed with a few flimsy remarks.

A table shewing the average excess of imports and exports into and from Great Britain for a hundred years past, arranged into periods of ten years each. Together with the average London prices of wheat for the same periods. Transcribed from the pamphlet, A Calm Investigation of the Circumstances that have led to the present Scarcity of Grain, &c. on the authorities, undeniable, there stated.

	Excefs of Exports. Quarters.	Excefs of Imports. Quarters.	Average price of wheat per quarter. £. s. d.
Anno 1700 by itself.....	170,641	.....	3 8 3
For ten years ending with..... 1710	284,503	.....	2 11 10
For Ditto.. ditto..... 1720	449,122	.....	1 17 0
Ditto.. ditto 1730	374,699	.....	1 16 6
Ditto.. ditto 1740	540,894	.....	1 17 6
Ditto.. ditto 1750	832,717	.....	1 13 8
Ditto.. ditto 1760	545,440	.....	2 2 6
Ditto.. ditto 1770	326,569	.....	2 7 4½
Ditto.. ditto 1780	.....	266,007	2 4 3
Ditto.. ditto 1790	.....	339,620	2 6 4
Ditto.. ditto 1800	.....	1,661,135	2 19 6
Anno 1750 by itself.....	1,667,140	.....	1 12 6
Anno 1800 by itself.....	.....	2,938,829	5 10 0
The excefs of exports amounted in the year 1750 to.....	1,667,140		
Allow for the distilleries, then permitted.....	200,000		
Excefs of produce beyond the home consumption in food of that year ..	1,867,140		
The excefs of imports in the year 1800 amounted to.....	.....	2,938,829	
Allow for the distilleries, not then permitted.....	.....	200,000	
Excefs of the home consumption beyond the produce of this year	.....	3,138,829	
Add excefs of produce anno 1750....	.....	1,867,140	
Difference between the produce of this country anno 1750 and 1800, supposing the consumption of corn in both years to have been equal.....	.....	5,005,969	

Let any man look upon this authentic statement of facts, and then lay his hand upon his heart and seriously answer the question: Can you indeed still persuade yourself, whatever you may have formerly believed, that the agriculture of this country has suffered

no undue depreſsion during the last fifty years? If the question must be answered in the affirmative, does it not become an indispensable duty in you, deliberately to inquire into the causes of such an alarming defalcation?

I have supposed in the last article of the table, that the consumption of corn in the years 1750 and 1800 were equal, and I am satisfied that the last could not materially exceed the first; for, although the increase of population within that period should be supposed to be greater than I am inclined to think it has been; yet the saving that must have been induced by the very high prices during the last year, when compared with the former (not much below the ratio of four to one) and the great consumption of rice and of potatoes, induced by that means, would be altogether sufficient to counterbalance that; yet, admitting that I should be here under some mistake, that error, if any, can at best be small, and cannot materially affect the general conclusion. It is unneceſsary to remark, that this table exhibits a clear view of the progreſs of agriculture in its general and most important department, and cannot be affected by the state of any trifling discrepancy that may arise in some of the leſser and local departments of that buſineſs.

Nor ought these facts, considered as to their general tendency, but merely in as far as respects their amazing amount, to surprise any one who has bestowed a due attention on the state of agriculture in this country; for nothing is more easy than it will be for such a one to develope in a satisfactory manner the causes of these interesting phenomena. The limits, however,

of this publication will not permit me at present to enter fully into the discuſsion. I shall only, before I close the present article, make one more quotation from the pamphlet before me, because its tendency is such as to call for immediate refutation. "Instead of the *thorns* and *thistles*, says Mr. H. (p. 28, in order to prove that tythes have been in no respect hurtful to agriculture; while speaking of Eſsex) the *waste* or the *wilderness*, the *heath*, or the *desert*, do we not behold, as it were, from east to west, from north to south, one extensive variegated garden! In plain, simple truth, when was the agriculture of Eſsex in so flourishing a state as at present? When were the exertions of the farmer and land proprietor so alert and spirited as during the last thirty or forty years? What extensive lays and pastures have been converted into tillage! What numerous hedge-rows, groves, and woods; what immense quantities of *timber*, which pays *no tythe at all*, have fallen before the axe and the mattock, to make way for *corn*, which pays one of the *greatest*, and most complained of! When were the farmers so opulent?—Where *has been* the *dead weight* of tythes so loudly lamented? How have they shackled the exertions of the grazier or the farmer? What reason has the land proprietor, what room have the public, to complain?"

If these observations are meant to apply to the country at large, as the general inference he draws can alone authorise, the table above exhibited demonstrates in the most decisive manner the groundleſsneſs of these exulting expreſsions. If they are intended to be confined to Eſsex alone, they are futile; because it is well

known, that local circumstances may operate on particular occasions, so as to produce particular effects that directly contradict every general rule. Without a specification of all those circumstances, therefore, such a mode of arguing is highly reprehensible in any serious discuſsion. Besides, how easy is it for any writer who chooses it, thus to make whatever conclusion he pleases; for he has only to utter boldly certain positions which he *asserts* to be facts, without any corroborative evidence, and the question must be decided as he wishes; because not one reader among a thousand has it in his power to verify the alledged facts. With such a mode of arguing in serious matters I shall never be brought to accord.

How little scrupulous our author himself is about aſserting things boldly as facts, for which there is not only no shadow of evidence, but of the falsity of which there existed upon record at the time he wrote the most decisive proof, will appear from the following paſsage. "Let it be remembered (he says, p. 80) that, notwithstanding the rapid increase of them (tythes) during the last fifty years [this fact then is admitted by him] English agriculture has continued to flourish *beyond comparison with any other period*, or with any other country in Europe; and no satisfactory reason seems yet to have been given why it may not do the same for fifty years to come." With regard to the first part of the aſsertion, the table affords a sufficient refutation of it, which exhibits a diminution of more than six millions of quarters of grain in that period; though the exceſs of production in the preceding fifty years had been above one million and a half of quar-

ters. With regard to the *second assertion*, I shall have occasion to consider it in a future part of this discuſsion.

That there are particular patches of certain counties of England in which the rearing of corn is still pursued with some degree of vigour, I know; and that the high prices which have been going of late may have enabled some farmers to make money with a greater degree of rapidity than usual, is also obvious to any one who considers the case. This is, indeed, one of those evils, so much to be lamented, which originate in those derangements of the political economy that of late have been suffered too much to prevail. But that the patches so circumstanced are few, and their extent so small as to deserve scarcely any degree of notice on a general survey of the kingdom, is not only made manifest by the table above exhibited, but is also palpable to the perception of every person who travels through the kingdom, and is not determined to disregard the information that he may thus derive. If the Isle of Thanet in Kent, a part of Eſsex (which I am willing to suppose is not misrepresented by Mr. H.), some part of Norfolk, and a few other such patches be excepted, the eye, wherever it is turned, meets with extensive tracks of graſs lands, much of it in such a state as is a reproach upon an agricultural nation to tolerate; which were, within the memory of man, cultivated corn fields. At the present moment I reside in the village of Isleworth, near Richmond; and in a circle of several miles around me, I find, upon a strict examination, at least a hundred fields in graſs that were, within the space of fifty years

past, in corn, for one that has been turned into a corn farm from grafs. The same thing nearly, upon a general view, I have met with in every part of the country wherever I have travelled. The fine county of Leicester, in particular, that I visited twice during the course of last summer, which was, about fifty years ago, as I was aſsured, one continued close field of corn, is now almost an universal waste. I call it a waste, because the grafs that it now produces, compared with what it might be made to yield, is next to nothing; and I am satisfied that the whole county does not now afford nearly one fourth part of the human food which it formerly did, and not one twentieth part of what it might be easily made to yield, under the management of skilful farmers whose exertions were not restrained by the influence of tythes, or other injudicious regulations. Almost universally, if you inquire into the former state of the fields that present themselves to the eye immediately around, by putting the question directly as it respects the particular fields in question, you will find, with a few exceptions, nearly the same answers to your queries; though it might so happen, that if you were to put the question generally, without stopping at particular cases, you might receive some doubtful answers: for, although every man can judge of a particular case that has fallen under his own immediate inspection, it is not every one who can form a just judgment upon a general view. In consequence of this general tendency to convert arable into grafs land, the quantity of human sustenance afforded by the soil must, upon the whole, be extremely diminished; for, on an average of land of different qua-

lities, one acre under tillage will afford as much food for man as four, at the least, in grafs: great then must be the decrease in food that results from this change, although the profits of the farmer may be thereby augmented. One great cause of the profit to the farmer is, without doubt, in this case, the diminution of tythe that he is thus subjected to; for the amount of a corn tythe, when augmented by the progrefsive increase of wages and other charges on husbandry, have operated most powerfully to make grafs-land more profitable to the farmer than corn land ever since the bounty was withdrawn. From the general change thus induced, has arisen that deplorable defalcation of food under which this country has laboured for some years past, the progrefs of which malady is so clearly exhibited by the table. Of the facts now specified every person may easily satisfy himself if he be so inclined. Upon this view of the case, might it not with good reason be asked, "if there be no common sense in the supposition," that tythes have operated as a retardment to agricultural improvement; or, "if the public have not good reason to complain of it." I shall take occasion to illustrate this question more clearly in some additional remarks which I shall offer in a future Number of this work upon some of the other positions afsumed in Mr. H's. pamphlet. In the mean time, it is hoped my readers will excuse the great length of this article, on account of the high importance of the object under discufsion; and that it may be all brought within the compafs of the present volume.

For Dr. Anderson's Recreations.

SIR,

IN the prospectus to your valuable work you in some measure promised to make occasional extracts from printed works; though I have observed very little of that sort hitherto, yet I am encouraged to hope that from this acknowledgment, and the willingness you have expressed to admit into your miscellany with pleasure pieces of wit or humour which are excellent in their kind, you will oblige me by giving a place in an early Number to the following piece of that description: for, if my judgment does not deceive me, you will think it well deserving of the distinction I claim for it. X. Y.

Fragment of a copy of verses to Lord March and Lord George, sons of his grace the Duke of R———d, on their dangerously falling through the ice at Godwood: illustrated with notes variorum, by Martin Scribbler, jun. Supposed to be written by B. Thornton, Esq.

LEAVE, rustic muse, the cot and furrow'd plains,
The loves of rural nymphs, and shepherd swains;
Lay by the lowly reed, whose simple notes
Die on the lonely hills round wattled cotes.

Furrow'd plains.] Lest we should imagine that the plains here meant were plain and even, as all plains should be, the author judiciously adds an epithet which unplains the plains at once.

Wattled cotes.] An elegant expression.

For strains sublime screw up the pompous lyre,
And boldly son'rous sweep the trembling wire.

Critics are in doubt what instrument our poet would here make use of; though I think it is plain, it can be no other than a *Jew's harp*. Nor is it any objection to say that this is sometimes in the mouth of the vulgar, since its notes seem adapted to such noble subjects as this. For, as the poet *Fustian Sackbut*, sweetly sings:

Buzzing twangs the iron lyre
Shrilly thrilling,
Trembling, trilling,
Whizzing with the wav'ring wire.

Son'rous.] Who, that has not lost his ears, can be satisfied with the cutting off the long O in this word? I say, read *snorus*; as the baſs or a *Jew's harp*, or (as it should be written) *Jaws-harp*, very nearly resembles snoring. B—NTLY.

While condescending nobles circle round,
In bending attitude, to judge the sound.

This is truly sublime. Here we have the humility (a rare virtue) the manner of sitting or standing, and the posture of the nobles who are (not barely to hear, but) to try, hang, or acquit the sound, as they think fit, and all in two verses.

Fancy delighted touches o'er the strings,
And warbling to the groves of Richmond wings.

The last line, I confeſs, has long puzzled me, and I suspect it is a false reading, and should be corrected thus:

And rambling through the groves of *Richmond* sings.

When *January*, newly in his reign,
With frosty fetters bound the rugged plain.

The history is this: *January* was the eldest son of *December*, and mounted the throne of his ancestors on the demise of his father. Now these lines are fine indirect satire on kings: for you see king *January* is no sooner pop'd upon the throne, than he makes use of fetters to bind his dominions to submiſsion. *O reges, reges!*

Rugged plain.] See note the second.

And o'er the pool outspread the icy sheet,
Tempting to slipp'ry sport the school-boy's feet;

Zoilus, jun. cavils at this first verse, as not thinking it a proper employment for king *January* to turn chamberlain. But sure, he forgot that even princeſses of old would darn stockings, or mend towels, or do any such housewifely work. Then sure our new monarch might make a bed without scandal, as the sheets were doubtleſs of the finest ice.

Two youths, whose birth the highest reverence claim,
Sweet buds of honour, rip'ning into fame;
Left the warm hearth to taste the freezing air,
'Twixt hiſsing woods by rocking winds stript bare.

Philosophers have not yet fixed the true taste of freezing air; though we may learn from this paſsage that it was not warm; because then the two youths would not have left the warm hearth, to taste it between hiſsing woods: so that we may conclude it to be hiſsing cold.

—*By rocking winds stript bare.*] Rocking winds. Nonsense. We must certainly read robbing winds,

and then the sense is complete. The winds were a sort of free-booty gentlemen, that stript the poor woods to the skin, and left them (in worse condition than *Adam* and *Eve)* without so much as a leaf to cover their nakedneſs. W—RB—RT—N.

> The starting deer before their footsteps fly,
> And turning shiver with astonish'd eye.

The ordinary reader will not be able to comprehend this paſsage. It means, that the deer run away from them, that they shiver with cold, that they turn to look, and consequently with an eye, which eye is astonished: and as they shiver and have an eye, they must shiver with that eye; and they must also shiver in turning, and turn in shivering: and so they turn and shiver, and shiver and turn. W—RB—RT—N.

Zoilus asks what their eye is astonished at? Why, at fifty things; at the buds of honour, the hiſsing woods, the rocking winds, icy sheet, rugged plain, frosty fetters.

> On nature's fingers turn'd, their locks embrac'd
> Their vi'let temples, pittoresquely grac'd.

Nature is here elegantly represented as a tyre-woman, or rather woman-barber; and as barbers bind the hair round their fingers to make it curl, our poet properly says, 'On nature's fingers turned,' to expreſs that their locks curled naturally. So intimately he knows arts and artists.

Vi'let temples.] A leſs judicious writer would have said, snow-white; and that not improperly, as it was the snowy season. But how much more significant is the epithet violet? For as violets are blue, and it is

common in cold frosty weather for the nose to look blue, so the temples will be blue or violet in so severe a frost.

The Cotton MS. has two lines immediately after these, which seem to come from our author.

> And *Jove*, kind barber, from his heav'nly puff,
> Those locks to powder, shook down snow enough.

> The furious blasts, with which the forest mews,
> Dancing the curls, their savage nature lose.

Every naturalist knows how such forests, agitated by the wind, in their sound resemble the cry of a cat, especially if she growls a little at the same time she mews.

> Lonely they wander'd through the leafleſs shade,
> And now beside the frozen water play'd.

How careful is our poet to let us know that the shade here meant is leafleſs, lest immediately on mentioning the shade of trees we should look for leaves, and be disappointed. We are not too nicely to inquire how the shade was made; for this is one of the mysteries which sublime poets are allowed to conceal from vulgar apprehensions.

> Doubting its strength, they try the brittle sides,
> Now lighter *George* towards the centre glides;
> *March* views his vent'rous feet, while gen'rous fear
> Tortures the eyebrows of the tender peer.

By *March* is not meant, as some will have it, the month so called; because it was *January* that was then king; and, as he was but newly in his reign just before, we can hardly suppose him to be dethroned so soon.

The trembling trees their lengthen'd arms extend,
And leaning, push'd by winds, towards him bend.

It is a doubt whether the trees would have bent towards him, had they not been pushed by the winds. For my part, I am inclined to think they would; for had they been unwilling to do it, they need not have stretched out their arms, as they did, but could have kept them close to their sides. And that they were earnest to help them, is confirmed by what follows immediately:

But vainly stretching out their fingers grey.
They whisp'ring call, and beckon him away.

What a sad fright must they be in? They not only stretch out their arms, but their fingers. Fingers grey, is an elegant and just expreſsion; though it requires a little circumlocution to explain it. Hoary signifies grey (as canus in Latin, and hoary hairs are the same as grey hairs) and hoary likewise means frosty, from hoar-frost. Now, as the fingers of the trees were covered with the frost, they were hoary, and if hoary, grey. How judiciously does our poet employ his epithets! W—RB—RT—N.

Zoilus, jun. impertinently cavils at this truly grand paſsage, in the following words: 'What occasion (says he) had the poet to say, that the trees stretched out their fingers, when he had told us before, that they extended their arms. This is tautology. And why (says the critic) did they only whispering call him? They should have hollowed out as loud as they could bawl, or else they could not be heard.' So far *Zoilus:* but in the first place, fingers here is not tautology; for could not the trees stretch out their arms,

and yet double their fists? Besides it was neceſsary, you see, for the trees to stretch out their fingers, as well as their arms, to beckon him away. As to the second remark, would he have the poor trees do more than they could? A whole forest, when heartily thumped by furious blasts, could but mew at most, as we find some lines above; then surely the simple trees could but whisper. And as they grew very near the bank, whispering was enough, and could very well be heard. Nay, if they could not, somebody else might; for,

> The ice with crackling voice bids him retreat,
> And from the centre, underneath his feet,
> Darts to the banks his shining character.

The older MSS. have it, cackling voice; but, as *Scaliger* observes, this expreſsion can only be applied to a goose: wherefore he rightly alters it to crackling, which is the tone of voice ice always speaks in.

> The sun beholds the silver-beaming star,
> And veils in thick'ning clouds his melting light,
> The winter-monarch shivers at the sight.

By the winter-monarch is certainly meant his frigid majesty,

> 'King *January*, newly in his reign.'

who, though cold, is as natural to him as his skin, yet could not help shivering at this lamentable spectacle.

> While from his icicle-fring'd seat of snow,
> In frozen equipage, amid the blow
> Of ice-lip'd winds, o'er hail-white pavements roll'd,
> He breath'd from marble lungs increasing cold.

We have here a particular description of his majesty's state coach. The cushion was made of the finest

blanched snow, and edged round with a beautiful fringe of icicles, a-la-mode de Paris. And, when his majesty chose to 'taste (or take) the freezing air,' he always went in a frozen equipage, which, instead of being dragged by horses, was pushed along by half a dozen chubby-faced winds with lips of ice, and rattled over the ways, which were paved with huge hail-stones. How suitable is this to the grandeur of a winter-monarch! And how much does it exceed the famous description of *Neptune* in *Homer's Iliad*, Book the 13th.

And breath'd from marble lungs.] How judiciously does our poet furnish his monarch with lungs adapted to every thing about him. For, had they been of mere flesh and blood, they must have thawed his throne, his coach, and his very dominions, and forced the poor prince to paddle in warm water of his own making.

> Swift from the puff descends a saline shower,
> The knitting winds exert their utmost power.

Why is the shower saline? Because all salts are cold, and as the breath that proceeds from marble lungs must of consequence be cold, it may therefore be called saline. We are also to suppose the monarch puffed away as fast as he could, so that he may be said to shower out his breath.

The knitting winds.] Some other copies have it knotting, which *Burman* prefers, as being a more genteel employment than that of knitting. But the context will not bear it. The allusion is to a hole in a stocking, to which the hole in the ice is compared;

and therefore it was neceſsary that the winds should be masters of the knitting-needle to be able to repair the breach.

> In vain—in vain—the lucid footing gone,
> The youth is swallow'd in the broken yawn.
> Death from the pool, rose grinning for the prize.
> *March* views the bony form with frighted eyes,
> And from his reach to reach his brother flies.

Reader, didst thou ever see a long ghastly figure of nothing but bones with an hour-glaſs and scythe in his hands on a country tomb-stone, or before an old ballad of death and the lady? If thou hast, then wilt thou easily perceive the propriety of this image, and conclude that *March* has reason to have his eyes frighted at the grinning, bony form. Who is meant by *March*, see my note above on this line.

> *March* views his vent'rous feet, &c.

and you will find that the eye-brows were tortured then by fear, as much as the eyes are frighted here:

> Yet from his reach to reach his brother flies.

How elegant is the repetition of reach? It is true, this is not so agreeable to the common way of speaking; for though I can say, reach me hither such a thing, yet you cannot say, no, I will reach it from your reach. But such sublime poets, as our author, are above being confined within the narrow limits of sense.

> The fractur'd cover bursts beneath his weight,
> He sinks, the waters round him circulate:
> He finds the bottom, o'er the liquid strife
> Rose up to kiſs the paſsages of life.

That is, ere the water rose as high as his mouth. We are to suppose that the water was very desirous of

kiſsing him, and fought with itself about it; whence arose a liquid strife.

Passages of life.] As food is the staff of life, and paſses in at the mouth, through the throat, &c. they are elegantly called paſsages of life. *Janus Dousa* will have it, that by this expreſsion is meant the paſsage behind, through which, says he, the food paſses out; and it is not expreſsly determined by the author whether he meant the fore or the back door of life. But it is scarce probable that the water rose up no higher: nor would it be quite so decent to say that the water wanted to kiſs his ——.

> Long in the muffled firmament, the rain
> Belly'd the cloudy spunges of the main.

Belly'd is certainly corrupt. We should read, belied; for the cloudy spunges seemed to say, we should have rain; but the rain would not come down, and therefore gave the spunges the lie. Or perhaps our author, who is fond of metaphors, wrote the line thus:

> Jelly'd i'th' cloudy spunges, &c.

that is, the rain turned to a stiff jelly, and consequently could not flow in drops. Either reading is extremely just and elegant. W—RB—RT—N.

Cloudy spunges of the main.] This is agreeable to philosophy; which teaches, that the clouds spunge upon the sea till they have sucked their belly-full of liquor, and then they are squeezed till they are dry again, which forms rain. This squeezing is *Jove's* office, as is told by two lines subsequent to these in the Cotton MS. and which are certainly our author's, who gives us in them another source of rain.

[Which *Jove* refus'd through fine-ey'd sieves to squeeze,
Or from his nose prolific drops to sneeze.]

Lest falling, running to the pool beneath,
Too high't should hold the silver snare of death.

But why silver? Would not a copper or brafs one do as well? But I never heard that fishing-nets were ever made of metal. They are generally made of pack-thread; but as death was a gentleman-fisher he might use one made of silk twist, and therefore I am inclined to think our poet wrote silken snare; which I have accordingly restored. TH—B—LD.

What would the blockheadly restorer be at? He is caught in a leaden snare I am sure. By silver snare the poet means pale or white; silver being always an emblem of that colour. W—RB—RT—N.

The poet very judic***y t*lls us tha* ***tation of th* *** had bee*.

As there is but one copy of these truly-valuable notes preserved in the *Cotton library*, it is in vain to hope that this *Hiatus valde Deflendus* can ever be restored. For,

——*Quod nec Jovis ira, nec ignis,*
Nec potuit ferrum, nec edax abolere Vetustas,
'Heu! morsu tineæ potuere, et ridiculus mus.'

What nor offended *Jove's* avenging ire,
Nor Gothic arms, nor spreading fire,
Nor time's devouring tooth could e'er annoy,
With envious bite the lurking moth,
The little mouse could secretly destroy,
Than time, or *Jove* more fell, or fire, or savage Goth.

ON THE IMPROVEMENT OF CLAYEY SOILS.

[*Continued from page* 262.]

In conformity with the principle indicated in the concluding paragraph on this subject, I now proceed to describe, with the requisite precision, the farther steps neceſsary to be pursued for ameliorating the field.

The lime being spread all over the field, no time should be lost in blending it with the soil as quickly and as efficaciously as poſsible. With this view, a firm roller of considerable weight ought to be paſsed once over its whole surface; and that ought to be followed directly by the harrow. By the preſsure of the roller many of the clods will be bruised, which being torn up by the harrows, the clods will be rendered more numerous, but of smaller size, than formerly. The same proceſs must be repeated again and again, the harrow always succeeding the roller, until the whole of the clods be reduced to a small size, and powdery state. If the weather shall continue dry, the proceſs will be soon accomplished; and, by the frequent harrowing, the lime will at the same time be so intimately blended with the soil, as to prevent it from setting into cakes of hard mortar as it absorbs its air, so as to become lime-stone once more. Great care should be taken to accelerate this part of the proceſs as much as may be; so as, if poſsible, to get it finished before rain comes on; for, although a *moderate* shower would tend greatly to facilitate the breaking of the clods, yet, should this happen directly after the lime has been spread, it might endanger the

scalding of the horses' hoofs, and the caking of the lime; so that, upon the whole, dry weather is best; and much rain, while the ground is in this state, is always highly prejudicial. To guard against this danger, all the steps of this procefs should be accelerated by every pofsible means: nor should these exertions be slackened until it shall have been laid out into ridges thus:

If the form of the field admit of a choice in laying out the ridges, these ridges ought always to be laid in the position that just admits the water to flow forward in the furrow, and no more. If the field has a steep slope in one direction, care should be taken, if pofsible, never to lay the ridges directly down that slope; for, in such case, the water in its descent, during violent showers, tears up the soil, washes off the manured mould, and does great damage to such fields; which will be the greater in proportion to the length of the furrow down the slope. Where it cannot be avoided, therefore, care should be taken to interrupt the furrows at moderate distances by some kind of crofs cut to carry it off. But, as these crofs cuts can seldom be made without trouble and expence, and require a continued attention to keep them in right order, it is much more advisable to be at considerable pains so to lay out the ridges at first, as to effect the purpose intended by the original furrows themselves; for, if this be once well done, it requires no farther trouble. And although, in general, it be most convenient to have ridges that are perfectly straight; yet there are difficult situations, in some hilly districts especially, in which a skilful farmer will find it ne-

ceſsary to deviate from that form, for the purpose of preserving a uniformity of slope every where; but, as these cases rarely occur, and as it is only the very accurate and skilful agriculturist that can properly adapt his conduct to the circumstances of the case, it will be unneceſsary here to attempt to specify them more particularly.

The ground being now in a dry powdery state, having the lime well blended with the surface mould, it should be instantly divided into intervals, not more than two feet and a half from each other, by furrow marks parallel to each other over the whole field. These may be called ridges, if you please. If you have a double mould-board plough, these furrows may be made by means of that implement; but, for want of that, a common plough may be employed to mark these furrows. In this last case, however, precautions must be adopted to preserve the ridges of an equal breadth, which will not be neceſsary in the other. These furrows need not be above three or four inches of perpendicular depth; and when they are once completed, I consider the field to be out of danger of sustaining any material damage from the weather, whatever may come: it being always understood, that great care be taken that no clods be suffered to remain in the bottom of the furrow (which will never take place if the plough be of a proper construction, and the operator sufficiently skilful). The farmer may now, therefore, rest in peace. If it had not been with a view to avoid future risk in a climate so uncertain as that of Great Britain, it might have been advisable to plough it several times in the flat before it was ridged up: but

I never lived in a climate where a prudent man could with safety venture that risk.

It has hitherto been a great desideratum in the management of a clayey soil, to have it put into such a state, as not to make it neceſsary for the beasts who are employed in labouring it ever to set a foot upon the surface mould in which the corn must grow; because, if that be not prevented, the ground cannot be ploughed at the season when it would otherwise be the most proper, because of the danger of its sustaining injury by the feet of the beasts. I have never seen this difficulty so well obviated as in a small district beyond Rumford in Eſsex, where the ground is so flat, and the surface so smooth, as to permit the farmers to lay their ridges indifferently in two opposite directions: that is to say, from east to west (we shall suppose) one year, and from south to north the next, and so on. The mode of management is, to make the ridges of two bouts each, as they term it, that is, twice round; which in general is about two feet and a half. The corn being sowed before ploughing, they direct the plough right acroſs the old ridges; and, as the distance from one furrow to the other is just a convenient step for the horse, they invariably step over each ridge, so as to leave the surface mould untouched. The seeds are covered by the plough, so that no harrowing becomes neceſsary; and the ploughmen have acquired such an adroitneſs in performing this operation, as to leave the field in the neatest state that can poſsibly be conceived, so as more to resemble, in a favourable season, a garden than a field. This is, indeed, one of

the neatest agricultural processes that I have ever seen in England.

Against this mode of procedure, however, there lie two objections; one of which is general, the other local. The *first* is, that, although the former furrows be thus more completely obliterated than one, upon mere speculation, might suppose could be the case; yet it is impossible to prevent the corn from being unequally distributed as well in regard to thickness, as the depth at which it is deposited: for, as two furrows must be laid towards each other at the middle of each ridge, and from each other at the furrows, a much greater quantity of corn will be accumulated at the middle than on the edges of each ridge; and the corn will be deeper planted in the old furrows than on the ridges. The same will happen with regard to manures, if they be applied before ploughing: besides, a part of the soil in the middle of each ridge cannot be properly loosened by the plough. The *second* objection is, that few situations will admit of having the ridges laid alternately in opposite directions; which must greatly limit its application. These considerations induced me to devise the following mode of ploughing such soils, by which means all the difficulties above stated are wholly obviated; while the object aimed at is attained in a much more simple, easy, and efficacious manner.

After the ridges have been laid out in the manner before directed, let the field be ploughed exactly after the mode that I have so fully detailed in the second volume of these Recreations, page 329, illustrated by figures as applicable to the purposes of horse-hoeing,

and which I conceive it to be unneceſsary for me here to repeat. By consulting that article it will appear plain to every intelligent reader, that the ground may be completely ploughed thus for any purpose whatever, in as easy and expeditious a manner as can be done in any other way; and that the soil must thus be more effectually and completely loosened than can be effected by any other mode of ploughing that has ever yet been devised (the turn-wrist plough in certain cases alone excepted); with the following additional, and in this case invaluable advantages, viz. first, that none of the beasts of labour can ever be permitted to set a foot upon the surface mould: secondly, that the soil must always be effectually freed from being damaged by superfluous moisture in any state of the weather: thirdly, that, in consequence of these two advantages, it may be safely ploughed at many seasons when it would be impoſsible to touch it under other circumstances; and, lastly, that under no poſsible state of the weather could the field be found in such a situation as that the operations upon it might not be safely interrupted at a moment, even without the poſsibility of its sustaining the smallest damage from a sudden and violent rain. Those alone who have long farmed such a soil can in any degree appreciate the value of these circumstances: to such persons, therefore, they will be plainly perceived, at one glance, to be of the most inestimable value: to others, it would be idle to attempt to state them; because it would far exceed the highest stretch of their imagination to comprehend it; I therefore paſs on.

Though, upon such soils as I here treat of, it is

absolutely neceſsary that the soil should be loosened, and impregnated with manures to the depth that I have specified in the preceding part of this eſsay; yet it is by no means neceſsary that it should be turned up to that depth at each ploughing; on the contrary, I should deem it highly pernicious to attempt it. If the soil be friable below, so as to permit the water to sink slowly through it, and to allow some of the strongest roots to strike into it without danger of being chilled, the great objects aimed at have been attained. After this is done, the farmer's chief care should be, to render the surface mould as rich and mellow as poſsible; for it is in this surface mould that all seeds must first germinate, and strike those roots by which they imbibe their chief nourishment. To that surface, then, the manures should be chiefly applied, and as long detained there as poſsible (for no art can prevent them from sinking downwards); and to the stirring of that surface mould should the principal agricultural operations be confined. The ordinary ploughings therefore, especially those of the summer-fallow after the preceding operations, need not exceed three inches in depth: it ought to be performed by one light, active horse, and as often repeated during the season as the weather and opportunities will permit; but not leſs than four or five times, if poſsible.

The crops that are best adapted for such soils are, wheat, beans, cabbages, potatoes occasionally; and, when circumstances call for your operations elsewhere, it may be laid down with broad clover for a season. The order of succeſsion may be various, as circumstances shall indicate.

In general, after an operation like that described in the preceding pages, it ought to receive a very complete dunging. By a complete dunging I mean about sixty cart loads (as much as two horses could draw upon the land) per acre. This should be laid on before it receives the last ploughing in autumn, and care taken that it be equally spread, and properly buried in the ploughing. But should the dung be long, this will render a deeper ploughing neceſsary. In all cases of this kind, it will be advisable to cause a person to follow each plough with a light dung-fork to take care that none be left uncovered. After this ploughing, the ground may be allowed to be dry during the winter, that is, till the month of February, when the first good weather that occurs should be taken advantage of, for putting in the seed.

It is one of the peculiar conveniencies of the mode of culture which I here recommend, that the land can be ploughed in safety even when the weather is moderately moist, because the narrowneſs of the ridges keeps it always dry; and the manures that it has received will soon render it tender and friable. Another advantage is, that one or more furrows only to each ridge may be ploughed at one time, if neceſsary, without producing any derangement. In consequence of these peculiarities, the seeds may be sowed in the first opened furrow, and directly covered up by another, without doing more, should the circumstances of the season render that eligible. But where the land is clean, and the ridges two feet and a half broad, some persons may approve of two rows of beans in each ridge; in which case, they should be planted in

two contiguous furrows, and covered up: the planting to be done in the following manner:

The drill most commonly employed for beans or pease, is like a small hand-barrow driven by a man, which follows in the same track that has been left by the plough, and they are covered by the succeeding furrow. As the ground on which this crop thrives best is stiff, and the season of sowing so early, any other sort of drill is inapplicable to the case; and this sort has been found to answer so well by many years trial in Scotland, that I think it unneceſsary to seek for any other implements. Of one very simple improvement, however, it obviously admits; which is, so to fix it to the plough, as to be drawn along with it in its progreſs, without requiring any person to push it; the wheel which communicates motion to the seed box will then run in the furrow behind the plough tail, and immediately below the handle; and, by having a catch by which it may be lifted from the ground, and attached to the plough-stilt at turning, it may be managed with the utmost ease.

One great use of a bean crop upon a clayey field is, to mellow the soil by means of the copious shade which it throws over the whole when in a state of luxuriant vegetation; and this will be prodigiously augmented by the perfect hoeing that our mode of culture admits of during the early part of the season, which will be heightened by the recent manuring. To add to these effects, however, I would advise, that no beans should ever be thus sowed, without sprinkling among them a few grey pease of the free shooting kinds that ripen about the same time with the beans;

about one pea for ten beans will be a good proportion. These pease, during the early part of the season, keep pace with the beans nearly, and, clasping to them, keep close in the row, so as to give no derangement to the hoeing process: but after Midsummer, when the beans, in consequence of their great height, spread abroad at the top, and meet together so as to prevent the hoe from having longer access among them, the pease, then, supported by the beans, stretch out over their tops with great luxuriance, and not only tend greatly to thicken the shade, and prevent the growth and maturation of weeds, but also to augment the produce very much, not only in respect to corn, but to straw also; which, in this crop, is an article of great value to the economical agriculturist: though I have reason to believe that the straw, especially that of beans, is generally in England applied to no other purpose than that of burning, or some other wasteful expenditure. Great, however, would be the loss sustained by the owner of such soils as those of which I treat, and slow his progress of improvement, compared to what it might be should he not adopt a more economical expenditure of this valuable article.

For the information of such as have not duly considered this subject, I beg leave to inform them, that the provender afforded by a crop of the sort I have here specified will, per acre, afford as much wholesome food for beasts as two acres at least of good hay; and that this food, for horses that work hard, is perhaps more nourishing than the best hay. This has been long known in many parts of the country respecting the straw of pease, though the haulm of beans is in ge-

neral so stiff and rigid, that those who have never had occasion to use a threshing-mill have not been able to employ that for the same purpose. When it is sufficiently bruised by the threshing-mill, however, or cut in the chaff-cutter, or softened by warm water, it is found to be equally palatable and nutritious as the other. It may, therefore, be employed very beneficially both as food and litter for beasts; and thus tend greatly to augment the quantity of manure, an article of high value in a farm of this description.

In the circumstances mentioned, the bean crop cannot fail to be very luxuriant; and, if the ground was free from root weeds, it will be in perfect good order for being sowed with wheat as soon after the beans are carried off as shall be convenient. In this case also the ground should be turned over with a light furrow, not above three inches deep at the most. The wheat should be sown by a drill of the same nature with that already described, fastened to the plough so as to deposit the seed in the bottom of the furrow, to be covered by the succeeding furrow, in which should also be seeds deposited by the drill, as in the last, and so on with every furrow. Thus would the crop, though drilled, be to all intents a broad-cast crop, save only that the seeds would be more regularly deposited and perfectly covered, and that no harrowing is necefsary. In this way, when the ground is in very high order, the seeds can be disposed so equally, and so thin, as to insure a most luxuriant crop without danger of lodging; and, should any annual weeds appear (which on such a soil will seldom be the case where due attention to this article shall be regularly con-

tinued), they can be easily extirpated. In this manner may be uniformly obtained a series of wheat and bean crops as luxuriant as the ground can carry: nor can there be a more beneficial rotation of crops on this soil than wheat and beans alternately for a series of years, the dung in all cases being applied to the bean crop: nor will it be neceſsary in many cases to dung it oftener than to every second crop of beans; and even then, a dreſsing to half the amount of that recommended above will be more than sufficient to keep it in good order.

It may be neceſsary to take notice, that if the ground has the smallest tendency to run to couch-graſs, it must be watched with the utmost care; particularly during the year of the hoed crop, so as to remark it when it first comes up during moist weather in the early part of the season; and wherever the smallest sprig of that graſs appears, let it be carefully eradicated by digging it up with a hand trowel, and following the course of the root with cautious circumspection, so as not to break it; never making any hesitation to dig up the corn for that purpose wherever it shall seem neceſsary. If the graſs be thus carefully extracted, it may be several years before a stalk of it can be observed in the field; whereas, if it be done in a slovenly and careleſs manner, the plants in this soil will multiply abundantly, so as to subject the farmer to continued trouble and expence, without deriving an adequate benefit from it. No one can estimate the difference in the expence that is thus incurred between a sloven and a spirited farmer; or the difference of the profit, though the expence seems at

first sight to be greater to the careful operator at the beginning. The beans that shall be accidentally displaced by this operation, if immediately planted, will sustain little or no injury.

But should there be the smallest tendency towards the production of couch in the soil, not more than one row of beans should in any case be planted; as the plough will thus be allowed to come close to the roots of the beans on each side, and thus greatly facilitate the extirpation of the couch. Should it so happen, however, that from a course of bad seasons, or otherwise, the couch should increase, it may be advisable to omit the crop of beans at times, and to substitute a crop of cabbages in their stead. These may be planted towards the end of May, so as to admit of having the ground ploughed entirely over twice or thrice; and by the distance at which the plants stand from each other, full opportunity will be given to clear the ground completely from this weed by the hand-hoe during the summer season.

As a horse-hoed crop also, where circumstances shall render it eligible, potatoes may be introduced occasionally; and in such case, the mode of cultivating that crop may be as follows: let potatoes of an early sort be obtained for seed, that will admit of being taken up toward the end of June, or in July, a complete crop. Many kinds of potatoes of this description are known, some of which carry very weak and dwarfish stems. These ought to be chosen, in preference to others of equal value. They should be planted in a single row on each ridge, as early in March as the weather will permit. These should be re-

gularly horse-hoed, in the manner described in Vol. II. above referred to. Toward the end of May, when the last horse-hoeing is given to that crop, let a row of plants of another later kind of potatoe be planted in the furrow nearest the middle-opening between each of the rows of growing potatoes, and immediately covered up. These will soon show their tops above ground, and by the time the early potatoes require to be taken up, the late-planted sort will require a first hoeing; so that, by the same operation, the first crop is taken out of the ground, and the second earthed up. The second crop may be then horse-hoed as the first, and taken up when the crop is ready.

By this mode of management the ground may be continued under corn crops for several years, and always growing better; and, if it shall suit the conveniency of the undertaker, it may, while in this state, be sowed with artificial grafs seeds (clover, and rye grafs) to continue for a few years; but it would by no means be advisable to think of converting the field into permanent grafs while it is in this state. Before that can be properly done, it must be made to undergo a second procefs similar to that already described; and even a third, if it is to be expected to produce grafs of the very best quality. Where the undertaker has that kind of perfection in view, which is easily attainable, he must prepare, after ten or twelve years continued cultivation, to proceed one step farther in his progrefs.

With this view it will be neceſsary to begin by ploughing his ground to the full depth of the staple that has been loosened; that, we have supposed, is

nine inches. After once turning over to this depth, it may be continued under cultivation in the usual way during one horse-hoed crop at least, and then ploughed once more to the same depth as before, in order to make the whole of that eight inches depth of rich mould as nearly of an equal quality as may be. When things are thus prepared, a furrow must be deepened at one side, as formerly advised (p. 356) to about twelve inches. The vegetable mould must then be turned down into this furrow, by a plough that goes to its whole depth, and then about four inches of the clay from the bottom laid above it, proceeding on in this way through the whole field. It must then be ploughed acrofs nearly six inches deep, so as to mix about two inches of the rich cultivated soil through it. It is then to be limed, and drefsed in all respects as has been directed for the former drefsing, and managed afterwards precisely in the same manner as before. The field will now soon attain as high a degree of fertility as can ever be wanted for cultivated ground; and may be continued in culture for any length of time under good management, increasing in fertility from year to year, without the aid of any extraneous manure of any sort.

But, if it be intended to be laid down into permanent grafs land, it ought still to be deepened to six inches more at least, by a repetition of the same procefs; after which only, it will be in a condition to produce maximum crops of sound grafs of the most nourishing quality.

Let those who think agriculture a trifling bufinefs attend to these details, of which only the leading out-

lines have been touched on, without entering upon a variety of particulars that require minute attention, and they will be soon convinced of their mistake. Let those who talk lightly of the operation of tythe advert to the vast outlay of money here required, besides continued care and attention in the undertaker; and then say, whether the depriving the farmer of a tenth part of the grofs produce, which may on an average of cases amount to more than twice the amount of the profit he can ever hope to derive from his enterprise, will prove no obstruction? Let them reflect well on the impenetrable nature of that barrier which is thus laid in the farmer's way, and which no exertions on his part can ever be made to overcome; and they will then be able to perceive from what causes such a large proportion of fields, that might be made the most productive in the country, are doomed to remain in a state of hopelefs sterility. Let those who think a lease of seven or nine years enough, or too much, for every agricultural purpose, reflect how it is pofsible for any person but once to think of engaging in enterprises of the sort just described. Let all these things, with others that it would be tiresome here to state, be considered together, and they will then see no occasion to wonder that this country, which, although physically capable of being made to produce food in abundance for perhaps a hundred times the number of people that it contains, is, in the actual state of things, not capable of producing, on an average of years, nearly enough to sustain its present population.

A CHARACTER.

Translation from the French of a lady's answer to a reproach of insensibility and unnatural coldness.

THE austere coldneſs and insensibility you reproach me with, and poſsibly think a constitutional fault, is neither the effect of prudery, nor the melancholy scruples of a silly saint. Believe me above such little motives of action; believe that my blood often circulates with rapidity; believe that I know there is but one spring in the year of life, and that love is combined with, and attached to humanity: nay, I will even permit you to believe that Cupid, in certain attire, has as many charms in my eyes as in those of the rest of my sex; yet after all these confeſsions, which I make with pleasure and openneſs, as artifice and disguise are only the refuge of little minds, which I have no occasion for, I tell you, that as much as I honour love, I despise lovers, and detest their perfidious flames, their deceitful arts, with their false vows, alas! often but too much credited by our amiable and credulous sex, merely because they feel no trace of such perfidy in their own gentle bosoms.

But if you would see my frigid system vanish into air, let fortune throw in my way such a man as my imagination sometimes creates, and whom I am afraid is only to be found there; however take my mental picture of him.

He must have a gentle though lively temper, to hide a strong and masculine mind.

His expreſsions of attachment must neither be dic-

tated by avarice nor vanity, but proceed directly from a feeling heart.

He must be well informed without pretensions, serious without melancholy, free without licentiousnefs, and in short carry nothing to excefs but love and prudence; nay, he may charm all my sex, and adore but me.

He must hide his pafsion in public; as I desire no other proofs of it there, but a pafsing glance to convey the feelings of his heart, which nobody must observe but me.

In private he may make up for public restraint in breathing a chaste and delicate pafsion; and if he merits it, he may probably hear of a recriprocal flame, pure as the love that fans it.

To render this union of heart more durable, he must be my guide, my friend, my counsellor, and my lover, so that, when near him, my mind may acquire elevation and grandeur.

Yes, I confefs it, should fortune throw such a man in my way, who alas, I am afraid, is but a creature of my own fancy, my coldnefs would vanish at his approach, like snow in sunshine; and I would accompany his footsteps at all times and in all places; but whether in a palace or cottage, I would never deign to bestow a thought.

Till that idol of my heart and mind is realised, I desire not to please, and shall persevere in my coldnefs, which never yet cost me an effort.

The group of admirers whom my feeble charms attract, are not flattering to me, I despise their senti-

ments, with their little arts to please, and yawn at their incense.

Let them seek the weak and vain, to hear their sighs and sufferings;—the zephyr bends the reed, but has no effect on the steady oak.

I cannot help mentioning a remark that occurred to me when translating this beautiful picture of a lover drawn above, that *physical* perfection seems to be below the attention of the fair painter, and is never once hinted at in the whole letter. *The Translator.*

Reading Memorandums.

"How long is the soul kept and nourished in ignorance of itself, and of its original, like a child of noble extraction, by some misfortune obliged to be concealed (and educated as their own) by poor peasants; who, believing himself to be of no higher birth, entertains no other than mean and low thoughts, and designs suitable to such condition! But, so soon as his true parents are made known to him, he quickly banishes from his mind all that is base and ignoble; and, animated by the knowledge of his true condition and towering expectations, he shapes his thoughts and his conduct to the greatnefs of his origin, and the splendour of his destination."

"When we consider our natural depravity and weaknefs, it appears to be as much our duty to avoid temptation, as it is to resist and overcome it when we happen to be inadvertently insnared."

36.

FEBRUARY 1802.

RECREATIONS, &c.

N° 6. Second Series, Vol. II.

ON CONVERSATION.

NOTHING tends so much to arouse the human mind, to call forth all its powers, or to augment the pleasures of life, as conversation. If this be admitted, it will also be allowed that no pains should be spared to develope those faculties, on the proper exertion of which the spirit of conversation depends, and so to modulate them as to render them productive of their fullest effect. This, however, is a branch of education that never seems hitherto to have obtained that share of attention to which it is justly entitled.

Man indeed feels a natural propensity to speak to those with whom he finds himself associated; and as conversation is nothing else than the communication of sentiments between man and man by means of speech, it may appear to be a superfluous task to pretend to teach that which every one, if left to himself, can naturally perform: but there are many natural propensities of man that admit of modifications which are well known to prove highly beneficial. To walk is as natural to man as to speak; and all men who are

not preternaturally formed can walk without any care bestowed upon this article by those to whom they are entrusted; but we all know the awkward movements and uncouth gesticulations into which those who are left to themselves in this respect usually do fall; and that, by a proper degree of care, these may not only be entirely avoided, but the body itself may be made to aſsume a form of which it did not seem before to be susceptible, which, at the same time, renders it more agreeable to the eye of every beholder, and gives also to all its members an agility and facility of movements that enables it to exert the mere animal energies more easily and powerfully than it otherwise could have done. To be convinced of this it is only neceſsary to take a parcel of men from the plough, and make them walk alongside a body of well-trained soldiers. The contrast is so striking, that no person can fail to remark it with wonder; yet the removal of this defect is so easy, that no serjeant would hesitate to undertake to make the first as perfect as the last in a few weeks training. If, then, a little attention can so easily be made to correct the natural defects in the one case, what reason have we to doubt that a similar degree of attention might produce a like happy effect in the other? I can see many reasons for believing that it might prove much more efficacious.

Before we can, however, attempt to remove a defect, we must first be sensible wherein the eſsence of that defect consists; before we can prescribe rules for giving to conversation that interest which constitutes its highest zest, we must know the circumstances which contribute so generally to render it uninteresting.

Contemplating the subject under this point of view, I think most persons will admit that the colloquial intercourse between man and man might be arranged under two classes, which, in their essential characteristics, may be plainly distinguishable from each other: one is, that kind of chat whose essence consists in shew, and whose sole object is to bring forward the speaker under the most favourable point of view possible; the other is, an interchange of ideas between two or more persons whose main object is to inform the understanding and improve the heart, by drawing forth observations which awaken the energies alike of the speaker and the hearer, that lead to farther progress in every liberal or beneficent undertaking. It is this last species of colloquial intercourse only that I would dignify with the name of *conversation*, and to it alone I must be understood to apply the characteristics mentioned at the beginning of this essay.

It will be easy for any one who keeps this definition in his eye, and who bestows a moderate attention to the intercourse of social life, to perceive that it is a very small proportion indeed of colloquial intercourse that can be called CONVERSATION: and this might give rise to two interesting disquisitions; viz. *first*, what is the cause of that general propensity among mankind to run into the line of uninteresting chatter? and, *secondly*, is there any means, that are easily within our reach, of moderating that propensity, so as to introduce a taste for interesting conversation more generally in society than is seen to be the case at present?

In regard to the first particular, it is very obvious,

that the universal cause of the evil which we wish to moderate is the vanity, with its usual concomitants, indolence and inattention, and consequent ignorance of the speaker. A desire to be elevated above others is, perhaps, the most universal propensity of the human mind; and is, when well or ill regulated, perhaps the source of the highest benefits and the greatest evils in society. In a state of nature, untutored by reflection, *self*, in the grofsest sense of that word, is the sole object that claims the smallest regard; and the utmost extent of power is the only limit that can be set to its imperious decrees. In the progrefs of society, however, it feels itself obliged to bend by degrees to the superior claims of a still more resistlefs power, which we call *justice*, and which controuls and sets limits to the pretensions of self, that it may not openly defy. Still, however, its influence is felt, and secretly cherished by every individual person; though its operations are so moderated, as to produce an infinite diversity of contrivances to admit of its being indulged to a certain degree, without openly infringing the formal rules of justice. These devices will unavoidably differ, according to the natural perceptions of the individual, combined with the culture that his mind has received. Among those of the most exalted kind, the selfish, blended with the social principle, afsumes a form so totally different from its first rude appearance, as with difficulty to be recognised for the same. Its propensities in this case admit not of a direct application; it can only be gratified by a kind of reflex sensation; a sort of reciprocation of ideas, arising from a contemplation of mind as it operates on this universe

in promoting pleasure or disgust. Contemplating the happineſs of others, it participates in this happineſs itself; and, by thus contributing to it, feels a delight more pure, and susceptible of infinitely higher degrees of gratification, than the indulgence of the mere brutal selfish appetite can ever be made to afford. The mind of such a person expands; the object of gratification, instead of being one weak, disgusting, isolated being, distending beyond these narrow limits, embraces without reserve, though not without degrees of discrimination, the whole race of sentient beings: he not only feels an interest in those that at present do exist, but his views are even extended beyond the limits of his natural life; he contemplates the state of those who are to be called into existence in future ages, and anticipates the happineſs that they may perhaps derive from the exertions, feeble as they may be, which he shall be permitted to make during the short period of his existence on this globe. Actuated by sensations of this sort, his mind looks forward to circumstances of such magnitude, that *self* becomes for a time an object too small to catch his attention; and the little objects of which feebler minds are enamoured sink into insignificance. Such is the man whose mind is susceptible of the charms of conversation. Perpetually in search of means that may enable him to attain the great end of all his wishes, he eagerly listens to every hint that ingenuity or sound sense can suggest from any quarter; and experience has long taught him, that such hints never fail to occur in the conversation of such persons: he listens, therefore, with pleasure, and not with that patience which mere complaisance would

inspire; while he, in his turn, developes with a manly freedom the ideas that occur to himself from those suggestions. Such is the nature of that colloquial intercourse which alone I would call *conversation.*

From these few hints, it does not seem difficult to perceive the cause of the uninteresting nature of those confabulations which so commonly take place in the usual intercourse of society; and at the same time to see that the evil, with a moderate degree of attention, might admit of considerable mitigation. Among the bulk of mankind, little care is bestowed on opening the minds, or enlarging the understandings of children in any way. They are dogmatically taught a few things, which they are told they must believe, and repeat, without knowing why or wherefore. Even among the higher ranks of life this rule is not departed from; and a boy at the grammar-school would be reckoned very impertinent indeed were he to whisper but a hint tending to ask an explanation of the reason for any rule that the master should choose to inculcate. A very good reason, indeed, might be assigned for this restriction; for rules must frequently be resorted to in these institutions, which the pupil could not be made to comprehend, were they to be explained with all the perspicuity imaginable: the fault, therefore, does not so much attach to the rule itself, as to the nature of the institution which renders such rules necessary. The unavoidable consequence of this implicit submission to authority is, that it stifles in its very infancy that natural propensity so strongly impressed on infantine minds which we call curiosity; which was evidently intended to operate as an un-

ceasing stimulus to the acquisition of knowledge; and which, if properly cherished, would gradually become stronger from day to day; so as to lead directly towards that state of mind in which conversation can become an interesting and instructive amusement. Instead of this, the mind, being thus fettered, loses its native powers: it loses the faculty of discrimination: it becomes vain of the little acquisitions which the self-sufficiency of the teacher has made him believe was the quinteſsence of all human knowledge; and, of course, the pupil looks down with contempt on all who are not as well informed on those subjects as himself: he becomes eager to display the superiority of these powers on every occasion, and seizes with avidity the first opportunity of doing this in company. Full of himself, he disregards all others. To listen to them he would deem weakneſs; and, if any one shall venture to diſsent from him in any particular, he considers it as an insult that deserves the severest reprehension. Such is the origin of that pert flippancy so remarkable among the *tyros* of our universities at their first outset in life; and, although the artificial rules of politeneſs, which have been devised for supplying those defects of understanding in respect to conversation, may tend to moderate the vehemence of those ebullitions of folly, yet this is but a poor succedaneum for the real knowledge, in the want of which they originate. Had pains been taken, in early life, to cherish that spirit of inquiry which is so congenial to every uncontaminated mind, many of those very persons, who now paſs through life in the most contemptible insignificance, might have contributed

largely to augment the welfare of the community, and have proved the brightest ornaments of social life.

Nor is the lot of the female part of the creation leſs to be deplored than that of the males in this respect. Girls, in those fashionable seminaries, by us called *boarding-schools*, where great numbers of them are shut up together, secluded in a great measure from the exhilarating influences of society during the most interesting period of life, must be there subjected to such strict rules, in order to preserve a moderate decorum of external conduct, as tend to repreſs every liberal excursion of the mind, and thus to deaden its native energies. They must sit without thought, act without a motive, speak without ideas, and learn nothing, in good earnest, but diſsimulation and disguise. In what a hopeful train such sufferers are for acquiring the talent of conversation, every one who thinks but for a moment will be able to see! Few ideas paſs among the individuals there, but such as tend to inflame the imagination or corrupt the heart. These ideas, which are cherished in secret, must be concealed in public; and deception becomes, of course, the chief study of their lives. The countenance is taught to wear a form as unlike to that which would denote the internal sensations of the mind as it can poſsibly be made to aſsume, and the lips are trained to the modulation of words that denote sensations of a kind totally foreign from those which actuate their conduct. *Self*, however, is here the object that is the most singularly prominent in all their conceptions; and the decoration of the body, not the improvement of the mind, is that toward which their attention is princi-

pally directed. The richest wardrobe, the most showy dreſs, the genteelest attitude, the smartest repartee, are objects of the highest ambition in every mind; and if Miſs can only succeed in distinguishing *herself* above others by any extraneous circumstance, her heart feels the highest degree of exultation of which it is susceptible. To these trifling objects, then, all of which perpetually centre in *self* as the only object of consideration, the whole mind is unceasingly directed at this very critical period of life; so that no other idea can find acceſs to it. When at last the period arrives in which they can be freed from those restraints under which they have been so long confined, they burst into society full of the idea of their own importance. Eager to display their own charms, those of others are disregarded. When in company, instead of that patient attention which constitutes the principal characteristic of conversation, and that (perhaps) silent aſsent or diſsent which indicates the intelligent mind, all are forward to speak, while each is so intent upon herself, as to be unable to attend to what shall drop from others; so that, when they are forced to sit silent, the blank eye indicates the vacancy within, which can be perceived even before the words that follow give the clearest proofs that what had paſsed had been wholly disregarded. To enlarge on this subject would be painful: and, though a slight corner of the picture alone has been exhibited; enough, it is hoped, has been done to show, that, had it been intended to repreſs the powers of the mind, and annihilate the talent for conversation among females, a more succeſsful mode of doing it could not perhaps have

been devised, than that which has been actually adopted in this country. Can we, therefore, be surprised if the unhappy objects who suffer under this cruel species of tyranny should be driven to cards and dice, to expence and show, to extravagance and dissipation, to the closet or the couch, to any thing, in short, to fill up that vacuum which the unfurnished mind must ever feel when it is left to the seclusion of domestic life, which should ever constitute the happiness and exalted glory of the mother of a family.

How different from these pitiable creatures is the woman who has been so fortunate at her birth as to be blessed with parents who have been able and willing to discharge with faithfulness the most pleasing task that Heaven in its never-ending bounty hath conferred upon man; viz. that of directing into the path of true wisdom the minds of their own children. Such persons will find a pleasure that no one else can know, in watching the developement of the first ideas of the infantine mind, and in affording that discriminative information which is suited to the progressive advancement of its powers, as these are indicated by the inquiries which will always be brought forward where such inquiries are not harshly repressed by severity or indolence. Here the parent himself may learn the first rudiments of conversation. Suffer the child to lead the way, he has but to follow, and take care that it falls not into error. The kindness that nature hath impressed upon the mind of a parent, for the wisest and best of purposes, occasions self to be lost sight of entirely during these interesting conversations; and the child, feeling its dependance, and the

never-ceasing satisfaction that it derives from the information it receives, exults in its happineſs, and rejoices in being enabled to communicate it to others at every fresh acceſsion of knowledge. The parent, to such a child, becomes the darling of its life; while the heart of the parent glows with the most unmixed delight at each burst of happineſs that it thus perceives. A mother and daughter thus grow up to be the friends and companions of each other: their conversation never flags: the inquiries of the child, if they have been properly directed, become every day more interesting: to supply the information required, the attention of the mother must be strongly directed to the acquisition of useful knowledge; in which pursuits the acquisitions of the husband may frequently become of use. Attention, then, to the conversation of men becomes neceſsary to the progreſs of the female mind. By this step, in the natural progreſs, the frivolity of pursuits, entirely feminine, are avoided. By this progreſs, too, ideas of *self* will never have acquired an undue preponderance in the mind of the pupil. Kindneſs to those who are found to minister so much to its comforts, is the prevailing sensation; and confidence in them, and candour, instead of duplicity, is the neceſsary consequence. This kindneſs of disposition and frankneſs of conduct become habitual, and extend to acquaintance in general; among whom, the freedom that social converse, under these circumstances, so naturally induces, will soon enable such as participate in it to discriminate the characters of those with whom they converse; which naturally lead, in time, to those tender connexions which form the

surest and only source of social blifs. In the family of persons so formed, conversation becomes in all cases entertaining, instructive, interesting: by its means the best of human propensities are strengthened, the pleasures of life are heightened, and human happineſs carried to the highest pitch of which it is susceptible in this world. Who will deny, if such be the consequences of a taste for conversation rightly understood; and if it be so easy to debase or improve that taste as has been above explained; that it becomes an important duty in the education of young persons to advert to this circumstance in a very particular manner? This, however, in a state where luxury has made great advances, is an undertaking too arduous to lead us to expect ever to see it accomplished. Parents, who have never themselves participated in the bleſsings of parental care, feeling themselves inadequate to the task of discharging these important parental functions, gladly devolve those cares upon others, who *say* they are willing to discharge them: thus bad goes forward to worse, till at last the very poſsibility of discharging such duties becomes exploded. Parental affection and filial duty come at length to be alike unmeaning words, whose influence is not recognized: and, these tender bonds of domestic comfort being diſsolved, can we wonder that all others should be disregarded?

In a disquisition of this nature, it might by some be deemed an unpardonable omiſsion not to take notice of the influence of books. My opinion of reading in general, where it is not undertaken as a task for the acquisition of knowledge neceſsary for succeſs in a particular branch of buſineſs, or where it is not sub-

jected to the test of full investigation among liberal-minded and well-informed persons in conversation, is, that it is rather calculated to impose upon the judgment, and lull the understanding asleep, than to promote the acquisition of true knowledge. The principal object of most writers is, to please their readers; and their study will naturally be, to discover and to concur with the taste of the public. Where it is known that the generality of readers are indolent and superficial, every disquisition that leads to deep thought will be avoided. The plausible, rather than the true, will of course be sought for; so that those who rely upon such guides will be frequently deceived. Nothing can counteract this influence but deep study, or a careful attention to the conversation of well-informed minds. To study deeply, can only fall to the province of a few: and, among the few who do it, it is only a particular department that falls to the province of each. By attending to the conversation of such persons, however, it will be easy for a candid inquirer to gather, from hints that drop from one and from another, and from the elucidations that flow from accidental incidents that occur, a general notion of the errors or deficiencies of that information which has been derived from reading, with the means of correcting them. Thus will be repreſsed, in the first place, that petulance of youthful vanity, which is the sure indication of a superficial information on any subject; and, in the next place, it will give an interest to reading that it could not otherwise have poſseſsed, by introducing a taste for discrimination and accuracy of research. Those very books may then become useful,

which otherwise could have proved only pernicious; for where the good can be separated from the bad, something good may be extracted from all; but where the whole is to be gorged by the lump, the dose will be found to be in most cases pernicious. Conversation, then, I conceive to be the most compendious and the easiest way of acquiring knowledge; and moderate reading, when corrected and refined by judicious conversation, will tend to accelerate the progress. But it never ought to be forgotten, that the chief use of conversation is, to show that no human being is infallible, and that every one, however much he may excel others in certain points, is still himself greatly inferior to others in a vast variety of particulars. To this rule the inquirer himself will soon feel that he is no exception: his mind, therefore, will be humble, though not passive: he will with pleasure receive information at this moment from one to whom he will the next moment perhaps be able to communicate information that will prove equally desirable. This mode of instruction is peculiarly adapted to the delicacy of the female mind, and perfectly accords with the domestic functions that fall to their charge. The quickness of their perceptions, and the modest docility of the uncorrupted female mind, render them peculiarly calculated to bear their part properly in this pleasing recreation; and the ineffable charm which their presence has upon every uncontaminated heart, gives to conversation the highest zest, where they have had the good fortune to be so directed in their youth as to be able to bear their part in it with propriety. How deplorable, then, must we esteem the manners of a peo-

ple to be, when they are such as to render in some sort neceſsary the seclusion of the male or female parts of the creation from the company of each other in the principal scenes of social intercourse among us!

ON THE NATURAL HISTORY OF FISHES.

[*Continued from page* 337.]

On the Migrations of Fishes.

THAT fishes migrate on some occasions, as birds do, we well know; but with the causes of these migrations we are in a great measure unacquainted. We are too much strangers to the economy of these creatures even to gueſs, on most occasions, at the circumstances that may influence their conduct. In general we are disposed to believe, that the movements of animals are chiefly influenced by the want of food, in quest of which their lives are chiefly employed; but that this is not always, at least, the reason why fishes change their place of abode we know, from what we have been enabled to observe with respect to the salmon, which, being more within our reach than most other fishes, has had the circumstances affecting it more particularly investigated.

The salmon is one of the few fishes which, though it can live equally well in salt or in fresh water for a time, cannot exist without a frequent change from the one to the other: hence it happens, that salmon are found in the sea only in the neighbourhood of some river: nor do they abide long in any river without going into the sea, from which they soon return, and

again re-mount the river. Their progreſs in these peregrinations has been remarked by fishermen; and all the devices of the latter are calculated to arrest them in that progreſs. Beside those irregular movements which seem to affect individuals only throughout the greatest part of the season, the following changes in their progreſs have been remarked as regular and periodical.

About the month of October, the salmon, then in full roe, when the season of spawning approaches, directed by an invariable instinct, leaving the deeper waters where they usually subsist, push forward into rills and shallow pools, where they deposit their spawn; after which they return, in a feeble and exhausted condition, to their former haunts, where they gradually attain greater strength, and in time come into better condition, so as in due season to become proper food for man, when he again resumes his suspended labours in search of them for food.

The spawn, fostered by the influence of the season, is in due time brought into life, and the young fry after a while begin, like their parents, to direct their progreſs towards the sea, near to which they usually arrive about the month of May, and towards which they then hasten. At this period of time they are from four to six inches in length only, being in some places called *smoults*, and are often catched in great quantities by boys, who amuse themselves with this diversion where they are permitted to do it. After a time the *smoults* totally disappear from the rivers. They are at this time gone into the sea, from whence they return in the month of June or July. They are

now prodigiously augmented in size, being from sixteen to twenty inches, or more, in length, and of proportionate bulk; so that they weigh six or ten times more than before. Their flesh has by this time acquired the reddish hue and peculiar taste of the salmon, which it had not before, and they are then called *grilses*. The augmentation of size in such a short period of time, and the other changes that have taken place, are so great, that it is no wonder that many persons should doubt whether these are the same kind of fish; but their identity has been ascertained by experiments often repeated. Many gentlemen, who live upon the banks of rivers where salmon abound, have amused themselves by catching smoults in their descent, and marking numbers of them by cutting their fins in a particular manner, or fastening brafs rings in them in such a way as not to admit of being easily disentangled, and then putting them into the water; many of which fishes have been again caught, at the distance of five or six weeks from that time, in the state of grilses; so that no doubt of their identity could be entertained.

It will be unneceſsary, and indeed impoſsible in our present state of knowledge, to trace the future progreſs of the salmon minutely. Like other fishes, they continue to increase in size, probably, as long as they live; insomuch that there are instances of some individuals having been caught that have weighed about a hundred pounds weight; at least ten times the size at which they are in a state to produce young. These are, no doubt, individuals which have fortunately es-

caped, far longer than their brethren, the perils that continually await them.

One circumstance only affecting this fish has been noticed, which seems to account for the neceſsity that they feel themselves under, so frequently to change their place of abode between the fresh and the salt water (for they never seem to experience a want of provisions in either); it is this: when a salmon has continued for a considerable time in fresh water, a particular insect, or louse, is observed to fix upon it, especially about the gills; where they increase very fast, so as to become extremely numerous and distreſsful to it. There appears to be no other remedy for this disease, but the going into salt water, where this insect cannot subsist; so that the fish becomes perfectly clean and healthy in a short time after it has entered into that element: but it has not been there long before it becomes infested with another species of louse, which cannot exist in fresh water; so that the salmon is forced to return once more into the river, in order to get rid of it. In this way the poor creature is impelled by neceſsity frequently to change between these two elements; but these changes take place respecting the fishes individually, and do not affect the whole aggregate body at one time; so that it does not occur periodically at regular seasons.

The above explanation is given, not in consequence of my own observations (for I have had no opportunity of making them), but on the authority of a gentleman of veracity who has long attended to this subject himself, and has had the best opportunities of ascertaining facts from the information of many fishermen who

have been engaged in that business for twenty or thirty years, and on whose joint testimony, corroborating his own observations, he relies. Be this, however, as it may, the certainty is, that the salmon is so much under the necessity of passing frequently from salt to fresh water, and the reverse, that it has been found, that in whatever river salmon have been bred, these identical salmon are observed never to desert that river and enter into another, unless when the mouths of the two rivers are extremely near to each other; and it thus happens that in many cases the salmon of one river have qualities and peculiarities that clearly distinguish them from those of the other; which separate qualities, the salmon of each river may possess perhaps for ages without alteration. The practical inferences that may be drawn from these facts (which I do not stop to enumerate) are obvious, and of great importance. There is, every season, the difference of more than a month between the time that the fisheries begin in the rivers Don and Ythan, both in Aberdeenshire, though the mouths of these two rivers are not more than twelve miles distant from each other.

There is one other peculiarity respecting the salmon, which, as it seems to be in some measure connected with its migrations, deserves to be taken notice of here. It is observed, that those salmon which are caught in the great fresh water lake called *Loch-ness* are never out of season; so that they may be caught and used at that time of the year when the killing of salmon is by law prohibited in most other places. May not this peculiarity be occasioned by the following circumstance? Nature directs those fishes that are in roe,

and about to spawn (when they are always lean and out of condition) to leave the deep waters and search for shallow pools, in which their spawn may be safely deposited. But it is probable, that it is such fish only as are in that condition, which feel the influence of that instinct. It is by no means improbable, that among fishes, as among other animals, some individuals may miſs having young at the usual season. If so, these individuals will not feel the instinctive impulse that makes them leave the deep water; they may, therefore, choose to continue there when the others abandon it for shallow streams: they ought then also to be in good condition; and, as they are then abandoned by the whole of their sickly companions, all that can be caught at that season there should be in good condition. If so, other lakes may certainly be found that are similarly circumstanced, in which the salmon are also good at that season of the year; and I know, in fact, that there are other places where salmon continue good at the prohibited season; but not knowing the very places I cannot examine particulars. If my conjecture be well founded, the salmon caught there at the prohibited season should never be in roe, or at least not near spawning. Is it so? Neither ought healthy fish to be at that season obtained without an intermixture of sickly ones, unleſs it be in large bodies of *deep* water; for where shallow water can be found near the edges, some of the sickly fish may remain there to deposit their spawn; so that they cannot be separated from the others: of course, the general law could admit of no exception in regard to such places, should it even hap-

pen that a considerable number of sound fish should be there at the time.

There is one other fish, nearly as common as the salmon in this country, that is migratory also, when in a situation to admit of it; but to which the neceſsity of these migrations is not such as to be indispensable: this is the *eel*. Eels, we know, can live and breed in stagnant ponds from which there is no outlet, as carp and tench, and several other fishes do; but whether they ever there attain the same perfection as under other circumstances, may perhaps admit of a doubt. In what place the eel deposits its young in preference to others, when it is at perfect freedom, I know not: or whether the young fry make a progreſsion towards the sea, as the salmon does at a certain period of its growth, I cannot tell. But this I know, from my own observation in one particular case, and I know that it has been observed by others in similar circumstances, that in the month of June in each year, immense swarms of young eels make a progreſs from the lower part of the river towards the higher, with a quickneſs and unremitted aſsiduity that are very surprising. I had occasion to remark this phenomenon in the river Dee in Aberdeenshire, where local circumstances, perhaps, contributed to render that peculiarity perceptible there, which may very easily be unobserved while it is paſsing with equal regularity in other places. The eel is a fish that seems (unlike the trout) to dislike running streams, and therefore avoids that part of the river where the current is strong. It had, probably, been this circumstance that induced them, in the rapid river Dee, totally to aban-

don the middle channel, and to direct their progress only along the edges of the river close to the banks: and it was probably the transparency of the water, and its shallowness at the edge, that enabled me to mark this phenomenon, which seemed to me not a little curious.

Having occasion at one time to walk frequently upon the banks of that river for several days together, I could not help observing a black kind of mark that ran along the edge of the river in an uninterrupted line wherever I went, very like the dark mark left by water on many occasions along the margin of pools where the bottom is gravel; which line followed the bends and windings of the river, being often suddenly deflected by stones or other interruptions without any breach of its continuity. This line had frequently caught my eye, without attracting particular notice; till one time that I came to a projecting point round which the current was brisker than usual; at this place I perceived a kind of vibratory motion in the line; and on looking closer, I observed something like the wriggling of an animal, making efforts to stem the current. I stooped down, and put my hand into the water to touch the line, with a view to examine what it was: the line became discontinued when my hand approached it, and I could touch nothing of it; but it united again as soon as my hand was withdrawn. This induced me to examine it very nearly; and I then perceived, to my no small astonishment, that this line was formed by an uninterrupted series of small eels, moving forward with great celerity, exactly in the same manner as a long file of soldiers might march

without interruption. These eels did not (as nearly as I can recollect) exceed half an inch in length, but were in all respects perfectly formed like the common eel. The line might perhaps, on an average, consist of from twenty to thirty in breadth, and the individuals being in different degrees of forwardneſs, and close to each other, made the line uniform without any thing like links or breaks of any sort. I observed them with great attention for a long time; and am convinced that they advanced with a progreſs of not leſs than four miles an hour. This progreſs continued, without interruption night or day, for eight days together that I remained at that place: how much longer it continued, I had no opportunity of learning; but there was no apparent diminution of it when I left the place. I croſsed the river on purpose to observe whether there was a similar line there, and found it in all respects the same. The water in which they floated at the place where I observed them was in general about two or three inches deep. I did not then think of going to a still deeper part of the river, which I might have found at a few miles distance; and I now much regret that I did not; as I think it probable that I should there have lost sight of them; for there they might have been dispersed more equally through the whole body of the river, and could not, of course, have been observed, especially if the water was deep, with a dark muddy bottom. It is probable, that in this manner the migration of eels, which I am satisfied must take place to a much greater extent in many other rivers, has been so little observed.

From the data above stated, it is easy to compute

that the numbers which must have thus paſsed, amounted to many myriads. What becomes of such multitudes of fishes we may conjecture, but never perhaps shall be able to ascertain.

The above observations respect the spontaneous movements of eels *upwards* in rivers; those that follow give indications of a similar progreſs *downwards* at one season of the year by the same species of fishes. There is in Scotland, in the neighbourhood of Linlithgow, a pretty considerable lake, commonly called in that country *Linlithgow-loch*, in which great quantities of eels are caught. These may be taken by hooks and lines during any of the summer months; but the principal fishing is in the month of October; at which time it is found, that the eels, directed by natural instinct, discover an irresistible propensity to iſsue from the loch by the paſsage through which the water flows from it to the sea. At that season of the year, then, the person who rents the fisheries of the loch, puts into that paſsage a kind of box, or chest, that is so formed as to allow free paſsage to the water, while it stops those eels that exceed a certain size. This kind of chest is every morning emptied of its fish, which are there found in such abundance as to require sometimes to be carried off in carts. The fishing season continues about a month; before or after which time few or none can be taken in that way; so that the chest is then removed, and the paſsage left free.

In Wiltshire also a similar practice prevails, by which great quantities of eels are taken every year. About Warminster, where the rivers are small, and more rapid in their course than in many other parts

of England, the mills placed on the streams are pretty numerous, and the water is carefully directed into one channel. The persons poſseſsing these mills having found, by long experience, that a great number of fine eels go down the river during every flood that happens about the beginning of October each year, have devised a kind of box, or chest, similar to the above, which they call an eel-grate; this they then place in a convenient part of the river, and thus great quantities of eels are caught, which they sell to very good account. But they find also, that no eels worth mentioning can be taken in this way at any other season of the year.

Whether the eels that are thus caught in descending the river are near the breeding time, as the salmon are which ascend the same small streams, has not been ascertained. Probably they are; but if so, they are not, like the salmon, then lean and out of condition, but fat and full, as haddocks are in January, when they are in full roe. It is probable, that these eels deposit their young somewhere near the mouths of the rivers. That these large eels ascend the rivers again at another season of the year till they regain their former haunts, there is room, from reason and analogy, to suppose; but their progreſs in this respect has not, that I know of, been remarked by any one. This circumstance appears to me in no respect surprising; because the same facilities do not take place for discovering them in their progreſs upward, were it even certain, as for that in their descent. In the latter case, they are precipitated by the current into situations where they cannot so easily make their escape,

and thus elude the attention of observers, as may happen in their ascending progress. They may have been at first entangled in their descent in baskets or nets whose mouths were placed towards the current. This could not be done in their ascending progress; and although devices called *cruives* have been invented for catching salmon in ascending the rivers; yet, the progress of eels in that direction having not been remarked, no contrivance that I have heard of for thus catching *them* has been devised. It ought also to be remembered, that the current, when the rivers are swelled, must force them forward at those periods in which they are now observed in much greater numbers than at any other, so as to render them then conspicuous; whereas, in mounting the river, their progress, by being more equally divided through a longer period of time, must be much less perceptible.

In confirmation of the opinion, that this progress may hitherto have escaped notice merely from our not having adverted to it, I may be allowed to remark, that, although there is reason to believe that there is not a river in the kingdom, especially such as derive their origin from marshes or extensive lakes, in which the eels at the regular season do not descend the river; yet, unless it be in the two cases above designed, which are so similar in kind, though separated at such a distance as to leave no room to suspect that the practices there adopted have been communicated from the one to the other, a similar progress of this fish has never been remarked. For my own part, I have not a doubt, from the above stated facts, that a similar progress in all cases must take place under similar

circumstances; and I am firmly convinced, that by attending to these facts with care, and adopting the arrangements that reason will suggest on such occasions, many beneficial fisheries of this sort may be established in situations where hitherto nothing of the kind has ever been deemed posfible.

It is perhaps unnecefsary to remark, that if the large eels do indeed return, it might be posfible, by watching the time of their progrefs, to devise contrivances for stopping them in their ascent somewhat similar to the construction of *cruives* for salmon, which might be done at a very trifling expence, upon those small rills especially that communicate with swamps or lakes; for though the banks were overflowed during floods, yet if these eel-traps occupied the full width of the rill, when in its usual state, no lofs could be sustained during floods; as the strength of the current would at that time interrupt their progrefs upwards. It is very probable also, that if the large eels do indeed return, they may do it more leisurely than they descend, especially where the water runs dead. It is, therefore, in brisk running streams that we shall most likely be able to discover the circumstances that affect these migrations.

It may be proper also to remark, that if my conjecture respecting the periodical migrations of this kind of fish be well founded, and general, it ought to follow, that fewer eels should be found in those lakes where the water as it ifsues from them falls over a steep rock, forming a deep cascade, than in others where the communication with the sea is more free; because, though the eels might be precipitated over

it in their descent, the young fry would be there interrupted in their attempts to ascend over it. Exactly such is the case with Loch-schin, a large fresh water lake in the shire of Sutherland in Scotland. Can any of my readers inform me whether eels abound in that lake or not, and whether those that are there found are in any respects distinguishable from others? I ask not if there be *any* eels in it; for that there will be *some*, I have no doubt; but the question is, are there as *many* as in similar lakes, below which there is no steep cascade?

The migrations of herrings, though the knowledge of them would be of much greater consequence to man than that of either of the former, are still lefs understood than those are. With regard to the fishes already noticed, though our information be but small, our judgment in respect to them has not been misled by false intelligence; so that, although we have much to learn, we have nothing to unlearn: not so with regard to herrings; for, though our knowledge respecting them be indeed extremely limited, yet every person who has but glanced at the subject, believes that he has a thorough knowledge of every particular respecting the migration of this interesting little fish, however imperfect his information may be respecting other particulars affecting it. Yet I am not, in fact, aware of any circumstance respecting the natural-history of the herring that is involved in such obscurity as that of its emigrations; so that we have much to unlearn before we can begin our search after useful information: and nothing afsuredly can tend so much to retard our progrefs in any research as the neceſsity of

this kind of retrograde motion, which is so unpleasing to the feelings of man in general, that many persons will rather choose to continue in delusion than make the neceſsary efforts to free themselves from its influence.

What renders the case particularly hopeleſs in the present instance is, the beautiful simplicity of the system that has been invented respecting this matter, the length of time that it has been received by all the literary world as an acknowledged truth, and the high authorities (if great names shall be admitted as such) that may be adduced in support of it. Yet, in spite of all these authorities, it will not be difficult, I imagine, to show, that well ascertained facts so evidently contradict that system, as of neceſsity to compel the attentive inquirer, whatever reluctance he may feel on the occasion, entirely to abandon the hypothesis as untenable, whatever difficulty he may find in devising another that shall prove satisfactory: but as error, he knows, must, at all events, be abandoned before truth can be discovered, he has no other alternative than to follow that course.

Who the person was that first published the popular account of the migration of herrings, I have not yet been able to learn; but that it was admitted as a true account before the year 1550, when Guicciardini wrote his *Descrittione de paesi bassi*, is certain; for he there distinctly details it as such in nearly the same terms in which it is now described; and it has been copied from him, or his authorities, by all the writers that have since treated of the herring fishery, with scarcely a single exception, and without the smallest

indication of doubt as to any particular respecting it being given by any of them. The outlines of this system are as follow:

The great receptacle of herrings, according to this account the *officinea gentium*, or grand store-house, from which the whole world is supplied with herrings, is the great Northern Ocean. In this unexplored retreat, they are said to be accumulated in immense multitudes during the early part of each year; from whence there issues forth annually about the end of May, or beginning of June (much, as it would seem, after the same manner as a swarm of bees issue from the parent hive), an immense swarm of herrings, which, proceeding in a compacted body in a southern direction, gradually fill all the southern seas that lie in the course of their progress. This immense swarm or schoale of herrings (as it is technically called) have, according to this account, proceeded so far in their course as to reach the islands of Shetland toward or before the middle of June. Here these islands, opposing their progress, compel the herrings to separate; one body of the fish proceeds forward along the eastern shores of these islands, which in their progress fill all the lochs [*loch* means here a narrow arm of the sea breaking into the land, such are Loch-urn, Loch-duich, and all the other lochs in the west Highlands] and bays on the western coasts of the continent, the Baltic being included among the number. Part of these still go forward, from which are detached small schoales which appear in the bays on the eastern coasts of Scotland. Still proceeding forward, they at length reach the coast of Norfolk

about the beginning of October, where the fishers of Yarmouth then find them; but, what is singularly remarkable, none have ever been found on the opposite coasts of Holland. The great body of the fish being by this time much divided, they proceed only in small numbers to the southward; and, coasting round the southern shores of Britain, they finally unite with their brethren, which had separated from them at Shetland, about the Land's End of Cornwall, near the beginning of winter.

Part of the schoale which went along the western coasts of Shetland, soon meeting the Orkney islands, there fill all the bays on these coasts that they encounter: the chief body, still proceeding to the west of these islands, at last meet the northern parts of Scotland and the western isles, and are thus forced once more to divide, one part continuing their progrefs between the main land and the western islands, the other going along to the westward of these islands, filling the bays of these coasts in their progrefs. They thus pafs on between the main land and the Isle of Man, a detachment proceeding at the same time along the west coasts of Ireland; till, finally, the remains of these two divisions join their long-lost companions about the coasts of Cornwall, where they disappear, and return as well as they can, but nobody knows how, to their original habitation in the Northern Ocean, to be ready at the appointed time to set out anew in their annual progrefs.

Such, in few words, are the outlines of the tale that has been told, and gravely repeated, as undeniable facts, by all our writers for three hundred years past. No

doubt, such a tale is well calculated to catch the minds of the multitude; for it has so much of the wonderful as cannot fail to operate powerfully on their imaginations; but one would conceive that this very circumstance should have induced philosophers to suspect that there might be some fallacy in it, and thus have induced them to compare and examine the facts on which it is said to rest, and thus to establish, without doubt, either its truth or its fallacy. I cannot, however, find that this has been done by any one; so that the task, thus late, has at last fallen to my share.

I myself, like most of those, I presume, who shall read this, for a great many years of my life relied with the most unsuspecting confidence upon the truth of this tale in all its parts; conceiving that so many men of the most respectable talents could not have propagated it with such steadineſs without having examined it with attention. In this state of mind I entered upon a survey of the fisheries on the coasts of Scotland in the year 1784. But my embarraſsment was great, when, on conversing with actual fishermen, who had long followed that employment as a buſineſs, instead of meeting with that beautiful arrangement that I expected, I found myself involved in a chaos of contradictory facts, which could in no way be brought to quadrate with the above hypothesis; and the ineffectual efforts I made to reconcile these, involved my mind for a time in the utmost perplexity and confusion. To free myself from this embarraſsing situation, I resolved to set aside all idea of hypothesis or system of any kind, and to attend to facts only as they occurred; and, having carefully ascertained them, enter them in

my minutes with the most scrupulous fidelity. Even the fishermen themselves, I found, had been embarraſsed in the same way as I was; so that when they attempted to give a connected view of the procedure which they ought to follow, it would in general have led to a conduct extremely different from that which they found themselves under the neceſsity of adhering to in practice; thus it required a steady attention to discriminate between the directions they gave as a rule of conduct, and the procedure they actually did adopt in the prosecution of their buſineſs; the last of which I marked with care, and the first was with equal caution totally neglected: nor was it till after a very careful collation of the facts thus obtained, that the fallacy of this long-lived hypothesis became clearly apparent. These facts I threw together in an Appendix to the report that I presented to the Committee of Parliament, on the Northern Fisheries, anno 1785, that has been since published in the account of the Hebrides, Appendix, No. 2, to which the curious reader, who wants full information on this subject, is referred. The few facts that follow will be sufficient, on the present occasion, to show the fallacy of that hypothesis.

If the hypothesis above stated had been well founded, the fishing for herrings in all the European seas ought to begin first in the most northerly parts, and gradually extend to the southward; but how do facts in this respect stand? Although much irregularity prevails with respect to the time when the fishery commences on different parts of the coast; yet there is in some cases a sort of order observable, which, though

not invariably steady, is nevertheleſs, on an average of years, pretty uniform. In this sense then it may be said, that the earliest herring fisheries on the coasts of Britain, are those on the coasts of the Isle of Man, and in Loch-fine. Herrings, on an average of seasons, are caught in these two places two months (often three months) before a single herring can be observed on any of the coasts of Scotland, or the Isles from Cape Wrath to the Mull of Cantyre; though it is obvious, by inspection of the map, that, had the hypothesis been just, the fishes could not have got to either of these places without having first paſsed Cape Wrath, and all the other places between that and the Mull of Cantyre. How then, it may be asked, should it so happen, that nine years out of ten they are first seen in these two southern stations?

Again: few herrings are in general to be found on the Orkney coast, where they should, by the hypothesis, abound in immense multitudes in the month of June; yet, instead of this, it is seldom that a single herring can be there caught at that season of the year; and the few herrings that can be there caught are taken only during the winter months, long after they should have deserted those seas.

Again: by the hypothesis we should expect that the herrings in their progreſs southward, in the month of June, when the north coast of Scotland, from Cape Wrath to Thurso, opposed their progreſs, could not fail to be then pushed in immense multitudes into all the creeks and bays on this coast. The fact, however, is, that scarcely any herrings can be there caught; and the few that are there found are chiefly caught in win-

ter. The same observations apply to the Murray Firth, in which, toward Inverneſs, a few herrings sometimes may be found, and still more during late years on the east coast of Caithneſs; but here also the principal fishing season is winter, when they ought long to have abandoned that coast. It deserves also to be remarked, that, although the Dutch, from the conveniency and safety of Braſsay sound in Shetland, have established that station as a general rendezvous for their buſses, from whence they are to take their departure on the 26th of June, to prosecute the fisheries during the ensuing season wherever they shall find it most convenient; yet the herring fishery that the natives occasionally follow on that coast, is not in the summer, but in the winter season. It deserves farther to be remarked, that on the coast of Sweden, not much to the southward of Shetland, the herring fishery never commences till toward the month of December.

It has been already stated, that the supposed progreſs of the herrings southward is at such a rate as that they reach Yarmouth about the month of October; and this fact has been deemed the most undeniable proof of the truth of the hypothesis. But though it be admitted, that the herring fishery begins with as much regularity at Yarmouth in the month of October, as it does at the Isle of Man and Lochfine in the month of June; yet these two facts, so clearly contradicting each other, only tend to show the groundleſsneſs of that hypothesis; more especially when connected with those that have been already stated; to which I beg leave to add the following. About eight or nine years ago a large body of herrings

was discovered in the Frith of Forth above Leith in the month of November, where they continued in great numbers till the month of February. They have made their appearance in the same place, and nearly at the same season, every year since that time, though they have never been discovered there till more than a month after the Yarmouth fisheries, so much south of them, were at the best, and had begun to decline.

Finally, to conclude this branch of our subject: the herring fisheries on the coasts of Hampshire, in the south of England, usually take place in the month of October, at the very same time with that at Yarmouth, both which fishings are ended some time in November; whereas in the narrow seas, within reach of the London market, it is well known, that herrings are caught occasionally, and sold in the streets of London, in the months of November, December, January, February, March, April, and May; but chiefly in this last month, when there is scarcely a year occurs in which they are not to be found there in abundance; at which time, according to the hypothesis, they should be all far to the northward of Shetland.

From these facts, to which might be added many more were it deemed neceſsary, it is evident, that the account of the migrations of herrings above quoted is entirely hypothetical, and is clearly contradicted by the most undeniable evidence; so that it ought to be abandoned as erroneous and chimerical.

That herrings, however, do shift from place to place occasionally, and keep together for the most part in great bodies called schoales, is an undeniable fact; but what the causes of these migrations are, or whither

they go when they withdraw from our sight, remain yet to be discovered. The following facts and observations, tending to lead to an elucidation of this circumstance, deserve consideration, because, whatever tends to develope the truth must at the same time augment the knowledge and extend the power of man.

[*To be continued.*]

Remarks on Mr. Howlett's Pamphlet on Tythes.

[*Continued from page* 370.]

THROUGHOUT the whole of his pamphlet, Mr. Howlett rests his defence of tythes chiefly on their *legality*. Thus, he says (page 84) "The general fallacy running through nearly the whole of the preceding strictures, seems to be the not considering that tythes, whether in the hands of the clergy or laity, are their *legal* and *constitutional property*, and that they neither are, *nor ever were*, the property of the state." And again (page 95) he says, "If it (the land) will not bear both rent and tythes, either rent or tythes must be waved, or the undertaking dropped. But the *right* to each is exactly the same, and the heavy charge of obstructing agricultural improvements falls equally upon both:" again (page 106) "the clergyman had a *right* to insist upon all the milk of every tenth day:" again (page 79) "But are not tythes as much the property of the tythe-man, whether clerical or lay, as any land estate in the kingdom is the property of its owner? Probably established too on a basis of much greater antiquity, especially the former of the two:" and so on in innumerable places.

In a disquisition respecting the *expediency* only of tythes, one must surely be at a loſs to conceive how any argument respecting its *legality* should have an influence upon it. I do not know that the legality of properly exacting tythe in this country was ever doubted; but aſsuredly no one will seriously maintain that a proof of the *legality* or the *antiquity* of any claim implies that the exacting such legal claims may not prove injurious to the community: nor do I presume that the advocates for tythe will pretend seriously to maintain that the antiquity of a legal claim ought to preclude a fair investigation of the effects of its operations upon the body politic; or, if it shall be proved to be pernicious, can these claims be urged as a bar to the right of parliament, if it shall judge proper, to remove them. That the very antiquity of an institution may render it pernicious, though it was once perhaps beneficial, is obvious, because of changes that may have taken place in the state of society between these two periods; and may not tythe be one of this nature? If so, where is the impropriety of pointing out these evils to the legislature, and requesting that judicious and equitable modifications of such laws should be made? Why then should those who enter into such investigations be stigmatised as persons who are inimical to any claſs of men in the state? I, for one, profeſs myself to be the friend of every man or body of men in the kingdom, who do not set themselves up as insidious defenders of claims that are clearly pernicious, and who thus, by endeavouring to pervert the understanding of legislators, tend to augment evils whose preſsure, if not judiciously removed,

will become, in time, extremely ruinous. It is by no means my wish to irritate, but rather to calm the minds of my readers: but it is impoſsible for any considerate person not to recollect, when he is thus driven to advert to it, that claims of the clerical order as a body, sternly urged as *legal rights*, founded on the antiquity of customs that have long been abandoned as destructive, deluged Europe with blood for ages together. I wish not then to see claims of this nature urged with too much pertinacity, lest it should provoke discuſsions that ought to be avoided. What, for instance, can be the meaning of the phrase, "that they (the tythes) neither are, *nor ever were*, the property of the state;" or, that the right to these, especially clerical tythes, was "probably too established on a basis of much greater antiquity" than the property of any landed estate in the kingdom? Aſsuredly it is not meant to say that the state, that is, the community at large, or any individual under the protection of the legislature, never had a right to do with the land itself, or the whole produce of it, whatever they deemed proper. Mr. H. will not surely maintain that there never was a time when Christian clergy were not known in this kingdom, and when, of course, no tythe could be appropriated to *their* support. If this position cannot be denied, what can be the meaning of saying that they did not belong to the state? What other power than the legislative authority could have appropriated tithe to the clergy? And, if it was not under the power of the legislature, by what right could the clergy acquire it? If the *whole* of the property once belonged to the state, or to those to whom the state

had assigned it, must not the tythe, which was only a part of that whole, have belonged to it? As to the antiquity of tythe in Judea, as appropriated to the support of the tribe of Levi, it concerns us not to inquire. The laws of Judah and of Israel certainly are no otherwise binding upon Britain, than in as far as the legislature of Britain have chosen to adopt them; otherwise we must have all been circumcised to this day. But the tythe, of Jewish origin, could only be introduced into Britain as a fund appropriated to the support of *Christian* clergy, after the Christian religion was introduced into this country. Was there no property in land before that time? I touch on these arguments merely to show the tendency of that spirit of partiality which I have above reprehended, and to offer a caution against indulging in such excesses.

One of the principal duties of the legislature of every country is, to correct those laws which, in consequence perhaps of a change of circumstances respecting society from the time of their enactment, have been found to have a pernicious influence on that community for whose preservation and welfare they were, no doubt, originally enacted; and there is upon record many instances of the happy effects that have resulted from an interference of the legislature in thus abolishing laws which had unhappily been too long tolerated as undeniably of great antiquity. One instance of this nature, which is exactly in point, I shall beg leave here to specify.

When the rebellion that broke out in Scotland in the year 1745 was ended, it was natural for the legislature to try to discover the circumstances which had

led to that event. In the course of that investigation it appeared obvious to them, that a custom which had obtained the authority of a law, whose origin was lost in its antiquity, but by which the inferior classes of men were rendered so entirely dependent on their immediate superiors, that they could not be deemed free agents, and of course were thus prevented from availing themselves of their natural powers in the pursuits of industry for their own emolument, had considerably contributed to that insurrection. Every landed proprietor in that country could thus, in particular, *legally* exact from those on his estate, at pleasure, services that were totally indefinite, under the name of *use and wont*; and the proprietor of every estate that had been erected into the *honour of a barony*, as it was called, had the power to make laws for the internal regulation of his own estate, that no one could contraveen, which went so far as to inflict the punishments of fines, imprisonment, and even death itself in many cases. To remove the evils that originated in this pernicious, though *legal* right, parliament in its great wisdom saw fit to annihilate at once the whole of those *heretable jurisdictions* in Scotland, and, in lieu of that, to assign to the respective possessors of those jurisdictions, a certain sum in money by way of compensation for them. Some persons who were fond of power, no doubt, complained of being deprived of their *right* without their own consent; but the general sense of the nation was so much in favour of the abolition of them, that these claims were disregarded, the law was passed, and the money paid out of the funds belonging to the state. From that mo-

ment the state of the country was immediately changed, and the improvements in agriculture, which so conspicuously distinguish Scotland above all other nations in modern time, date their origin from the year in which that law was paſsed. Again; at a later period still, it having been found that the independent kingdom of the Isle of Man, which belonged to the duke of Athol as sovereign, was employed as a harbour for smugglers, by whose means the public revenue was greatly diminished; the legislature took the case into consideration, and, finding no other mode of removing the evil than that of destroying its independency, they paſsed an act to purchase that regality from the duke of Athol, and it was purchased for the sum of 70,000l. by 5 Geo. 3, c. 26. Who then will dare to say, that the legislature of Great Britain has not a right to inquire into the tendency of tythe to retard the operations of agriculture, and to abolish the tythe entirely, if it shall be found that its tendency is pernicious; giving, in lieu of it, such a compensation to those who have a legal right to tythe, as they in their wisdom shall think fit? If it be the duty of the legislature to investigate such questions, it is certainly at the same time the duty of every well-disposed subject to bring forward such facts to the public at large as have fallen within the sphere of his observation, which have a tendency to elucidate the question. Such, and such only, are the motives that have ever induced me to enter upon this investigation.

I must take notice of one other opinion indicated in these extracts, to which the author recurs in innumerable parts of his work, viz. the identity that he

always supposes to take place between the operation of rent and tythe. "The right to these (he says) is exactly the same, and the heavy charge of obstructing agricultural improvements falls equally upon both." That many persons should fall into this vulgar misconception, is perhaps not very surprising; for few have been at the pains to investigate the subject fully; yet one would think that it was incumbent on an author who makes such serious charges against landowners as Mr. H. has repeatedly done in this pamphlet, to inform himself particularly as to this subject. Speaking of the rise of rents that would probably take place were tythes commuted, he asks, p. 97, "What in that case must become of the poor tenants? Must they not be squeezed to death?" One would imagine that before a man could prevail upon himself to write in this absurd strain, so contrary to the universal feelings of mankind, he would have taken some pains to be sure that he was well-informed on the subject. Those who have perused the disertation on rent and tythe inserted in the Vth volume of these Recreations, page 401, will be able to judge how miserably deficient he has been in this respect. To that article I refer for a full refutation of all that he has so incautiously uttered on this subject.

This is, however, a favourite topic with Mr. H. and he returns to it again and again; particularly in pages 34 and 35, where he says, that if the farmers were relieved from tythes, the landlord "would have stronger temptations to tyranny; the former (the farmers) would be in imminent danger of becoming mere slaves and vasals;" so that tythe, we find, is,

according to him, not only no obstruction to agriculture, but its sole safeguard and protector; which, if removed, must prove the absolute destruction of all the farmers in the kingdom!!! In support of which truly *original* opinion, he adduces the following curious illustration.

"The writer (he says) of the general view of the agriculture of the county of Mid Lothian, in Scotland, says, "tythes are unknown in this county; a circum-"stance with which the proprietors in particular have "reason to be satisfied, as it is *one* of the causes of "*rents being high*, and the profits of farming being "low." Page 56. "This fact, Mr. H. adds, is worth a thousand speculative reasonings."

"The same writer (he adds, page 52) gives us another piece of information of similar tendency. "There "is, perhaps, no profeſsion whatever, he tells us, which "gives so small a return for the stock employed in "trade, and the knowledge and application neceſsary, "as does agriculture in the vicinity of a great town, "where, from the great competition for land, arising "from the continual influx of noviciates, who are "eager to become farmers, the profits of the real hus-"bandman are reduced to the lowest degree of recom-"pence. Thus, while it may be observed with what "rapidity fortunes have been lately here acquired, not "only in the higher profeſsions, but even in the lower "mechanical arts, there is hardly an example of a "farmer being able *to raise himself above his former* "*station*; although the husbandmen here consist of a "body of men three times more numerous, and poſ-

" seſsing a stock in trade six times greater, than that " of any distinct profeſsion whatever."

" Have we not here (says Mr. H.) a striking illustration of what I have above supposed would be the consequence of the abolition of clerical tythes, that what the English farmers now contingently get by the general moderation of the clergy, the landlords would immediately put into their own pockets, &c.? The *Scotch farmers*, we find, in the vicinity of great towns, [and he might as justly have said every where else] cannot advance one step towards the improvement of their circumstances, but remain in their original stations as *poor as their ancestors*; though they are free from the burden of tythes, with all their oppreſsions and embarraſsments, which are here so loudly lamented. How is the case with the *English farmers* in similar situations? Visit the neighbourhood of London, of Sheffield, of Leeds, of Manchester, of Liverpool, [aſsuredly Mr. H. never was in the neighbourhood of these places to examine the state of their agriculture, he has been considering the mercantile or manufacturing profeſsions] of Birmingham, and you behold the *poor creatures* so shackled in their exertions, so crushed by the *dead weight* of tythes, so haraſsed by the oppreſsions of *tythe-men*, and the rapacity of *parsons*, that they are every day rising into opulence, purchasing estates at higher prices than others can afford to give for them, and finally turning their backs upon the plough, and the dung cart, and commencing gentlemen." In another place (p. 29) he says, " nay, cast a glance over the kingdom (England) at large, and do we not see its cultivation grow-

ing and flourishing in every part? *Is there a nation in Europe where its advancement has been more rapid, or in which it presents a more enchanting spectacle, even those countries not excepted where tythes are unknown?*" I answer without hesitation, YES, and I shall soon adduce satisfactory evidence of it.

The above might, I think, be given as a very fair specimen of the nature of the facts and manner of conducting the argument throughout the whole of this pamphlet. Were the subject of leſs real consequence, it might give room for some remarks that might tend to enliven our page. In this instance, however, we shall not be diverted from the sober path of argument by the temptation here thrown in the way. The few following remarks will show the futility of such a mode of arguing.

That the farmers in Scotland pay no tythe, is a truth that is universally known; and that the profits on capital employed in agriculture is there, as every where else in Britain, leſs than when employed in any other buſineſs of note in the island, will not be disputed by any one who knows thoroughly either Scotland or England. But where Mr. H. learned that the agriculture in Scotland is in a leſs progreſsive state than that of England, or that the farmers there are "*as poor as their ancestors*," and "*cannot* advance one step in the improvement of their *circumstances*," I cannot tell. Aſsuredly neither of these facts are contained in the extract that he has made from the survey of Mid-Lothian. I know the author of that book very well; and I know also, that there are few propositions you could enounce to him to which he would more

warmly object than that such an inference could be fairly drawn from his writing. I know the country too to which this writing refers; and I know farther, that nothing would be more contrary to truth than such an allegation would be, had he, in truth, made it. I know farther too, that in that county (the very county wherein I myself was born) and those adjoining to it, agricultural improvements have advanced within the last fifty years with a rapidity that is so far from being equalled by that of any part of England, that an idea of it could scarcely be conceived by any one in this kingdom who has not been witneſs to it. I know also, that the bulk of the farmers there are an independent-minded, respectable, well-informed claſs of men, who, though not in general what in the present times would be called wealthy, are greatly more so than their grandfathers were, and capable of attaining every enjoyment that is suitable to their station in life; and who would look down with contempt on the pitiful operations of the farmers in general round Liverpool, Manchester, and the other towns mentioned, not London excepted; where, unleſs in a few patches above excepted, and grazing, which I scarcely would call agriculture, the meaning of the word improvements, when compared with *their* exertions, seems to be scarcely known. These are things that I know, and that every one who is equally acquainted with the places in question, as I am, will have no scruple in acknowledging. No wonder, then, if I should be astonished to find a man who could venture to draw such an inference from a writing which gives not the smallest countenance for it, and

that is so directly the reverse of the real state of facts.

That the very flourishing state of agriculture in Scotland at the present moment, and the vigorous exertions that have been there made by the farmers, are principally owing to the absence of tythes too, no one who knows what these exertions are or have been, can doubt; nor will any considerate person be ever brought to believe, that, had tythe been demandable there, any thing like to one fourth part of the quantity of corn which it now yields could ever have been produced in that country. A man who writes thus boldly should be either well acquainted with the facts himself, or should take care that he does not draw inferences from writings which those writings do not authorise. That Mr. H. is not acquainted with the facts, is clear to every one who does know them; and it is equally clear, that the quotation does not authorise his inference.

The writer of the articles quoted has very truly said, that agricultural profits are less than those in any other business, and has justly assigned the reasons for it; in consequence, he has very properly observed, "that there is hardly an example of a farmer being able to raise himself *above his former station*;" that is, above the station of a farmer; "although the husbandmen here consist of a body of men three times more numerous, and possessing a stock in trade six times greater, than that of any distinct profession." The truth of this position I will avouch as to Scotland; and, notwithstanding the bold assertions of our author to the contrary, so often repeated in this pamphlet, I

can see no reason to think that England affords the smallest exception to the rule, but much the reverse. For, although it cannot be supposed that in a business in which such a very large proportion of the people, and so great a share of the capital and industry of the nation, has been continually employed for centuries past, some few individuals among them should not have been able to acquire a fortune and purchase an estate, so as to rise into a higher station; yet it will be no difficult matter to bring convincing proofs, and such as come within the knowledge of every individual who chooses to investigate it, that for one farmer who thus rises from his original station, there are at least a hundred in every other profession in this country, in which is embarked from the beginning an equal amount of capital, and where equal industry is exerted, who do so.

Let any one who entertains a doubt of the truth of this position adopt the following mode of procedure, and he will soon be able to ascertain the fact. Let him take one hundred men without selection, who are engaged in any of the active professions in London; such as merchants, shop-keepers, master tradesmen, and others, and let him diligently inquire, so as to ascertain, what was the amount of capital in money that each of them possessed at his first outset in life. Let him then take a hundred farmers [mere graziers I still say are not entitled to the honour of being ranked among them] in any of the adjoining counties, without selection also, and ascertain by the same means the amount of the capital that each of them possessed at his outset in life; and he will soon find that the agricultural

exceeded the mercantile capital at their outset in life in the ratio, I have no doubt, of four to one at the least.

Let him then make the same kind of inquiry into the amount of the capital of a similar hundred persons in each of these two classes, when they have attained the age of SIXTY years; and it will be found, I have no doubt, that the capital of the mercantile class exceeds that of the agricultural, at that period of their lives, in the proportion (perhaps of ten, but we shall say only) of four to one.

Let him then look into the amount of money that has been expended by each of these classes, on personal and family expences respectively for the course of forty years past; and I do not suppose that any one who is in the smallest degree acquainted with subjects of this nature, will scruple to admit, that the mercantile expenditure has been more than double that of the agricultural during all that time. Nor should I be surprised to find, that this last article alone, when augmented by interests upon it, should equal the whole of the agricultural capital at the last named period. If these facts are so, or nearly so, who will pretend to say, that money employed in agriculture gives nearly an equal return to that which the same money employed in other kinds of business in this country would do?

As it is impossible, however, to get at the facts above referred to with absolute precision, I shall beg leave to refer to some other sources of information, which will serve to show that the conclusion above stated is well founded. Take a ride round London in any direction you please, and you will find that the country is every where ornamented with fine houses, attractive villas, and habitations that bespeak the opu-

lence of the owners. Inquire who are the owners or occupiers of these superb palaces; take Lysons's accurate survey of this district in your hand, and you will find that nearly nine out of ten are the country residences of merchants, manufacturers, or tradesmen, who keep their town house and country house, their equipage and servants; or of men who have made their fortune in trade, and have retired from business; while not one in some hundreds of these (I do not myself, indeed, know one) is occupied by a farmer who has made his money in that line of business. Whence comes it, I would then ask, that we should be led to the same general conclusion by these two different tests, if it be not that agricultural profit is less than the general profit in other employments in this country?

But, though these two tests will be sufficient to satisfy any impartial inquirer, we have no occasion to stop here in our illustration of this particular; and I shall proceed a little farther. Every one knows that the city of London abounds in Scotchmen. You can go into no company in which some of these, often a large proportion, are not to be found. What is it that induces so many of them to come hither? No one will alledge that it is the superabundance of their capital that forces them to leave their native home; on the contrary, it is generally admitted, that it is a deficiency in that respect which drives them thence, and the hopes of bettering their circumstances that draws them hither. These emigrants (if you please so to call them) with a very few exceptions, consist of the sons of gentlemen of small landed property, of clergymen, and of farmers, who, finding that they had

not stock sufficient to be able to put their sons into the business of farming, are forced to content themselves with giving the young men the best education that their circumstances can afford, and then make them trust to their own attention and industry, and avail themselves of their natural talents and acquirements, for earning their own subsistence in a respectable way. What use they make of these talents and acquirements, and what success attends them in business, may perhaps be better ascertained in the change of London than any where else; where, if all the persons who were originally of the above description were taken away, a most deplorable blank would be experienced. How few of these emigrants, however, do we find occupying the agricultural departments in this country, though this be the favourite pursuit of most of them! Not one in a thousand of them enter upon that business; and why? The answer is plain, their capitals are inadequate to the purpose. In other employments, attention, assiduity, and fidelity, are found on many occasions to supply the want of capital; and are the sure means of obtaining, in due time, respectability and credit, by means of which wealth may be accumulated in city business to an indefinite amount. Not so with agriculture. The man who shall engage in that employment, whatever his skill and industry may be, without an abundant capital in hard cash, will soon find himself involved in difficulties inextricable, under which he must succumb. If these do not afford proofs that industry, talents, and capital are less productive of profit in agriculture than they are in other modes of applying them in this country, I do not know that we can look for proofs of any thing of the same nature in any case whatever.

I purposely mentioned the natives of Scotland in the above example, because their language makes a distinction that is more easy to be recognised than some others; but you are not to suppose that the same circumstances do not operate after the same manner in all other parts of this country. From every county in England and Wales there is a like efflux of persons of a similar description from the country towards London and other towns. These persons, in the earlier part of their days, are chiefly employed in managing the business of such men as have already acquired a sufficient capital to be preparing to retire from business, and these young persons come gradually to occupy the places of those rich citizens as they withdraw to the country in order to commence gentlemen; so that were the whole of those persons who have come from the country to the metropolis with little or no capital to be withdrawn from it at once, there would be a total stagnation to trade and business of every sort; and what was once said sarcastically by one person might be said then with great truth, that *here is a city to be let*; for small is the number of the children there of such parents as have not amassed fortunes sufficient to be able either to retire from business entirely, or who find it unnecessary to manage it otherwise than through the ministration of others. In agriculture, however, this is far from being the case. The little capital that has been slowly acquired by attention and frugality in that business, descends from the father to the son, usually for many generations, before one of them is able to rise into a state of respectable independence. With these facts before our eyes, written in characters sufficiently legible to every one who is disposed to read them, how is it possible to

deny, that in no business in this country are the returns for capital and industry so small as in agriculture?

I should not have taken the trouble to arrange these facts, and to bring them together under this point of view, had I not conceived it to be a matter of the utmost importance that they should be now adverted to, not to the welfare alone, but to the very existence of this country; and I most sincerely regret the inefficacy of the power that is thus exerted to accomplish the end. If the indignation I have felt at seeing writers of some name incautiously fanning instead of allaying the flame of popular delusion that threatens to prove so very destructive, has betrayed me into some degree of warmth, it is to be hoped that the urgency of the occasion will plead my excuse. We all feel at present the pressure of an evil, viz. the alarming deficiency of crops within the last half century, the gradual approaches of which have been too long disregarded, until the pressure of late years, so clearly indicated by the table (page 364), has forced it into notice. But, instead of inducing a calm investigation of the causes of this alarming appearance, it has only given room to torrents of unmeaning declamation, that has no other tendency than to augment the evil. The original causes of this malady, from the above investigation, are made clear and manifest. If agricultural profit be evidently less than that in other employments that are alike within the reach of men, and if farmers be kept in a state of dependence by reason of inadequate leases, and of harassment that others do not experience by claims for tythes and poor's rates, is it consistent with common sense to think that they will not abandon that business and apply themselves to others? If the weight of corn tythe, together with the

expense of cultivation, makes farmers find it their interest to abandon the culture of corn for that of grafs, who can prevent them from doing so? And if the quantity of human subsistence that can be drawn from the soil be thus prodigiously diminished, compared to what it has been or might be, ought we to be surprised that scarcity is experienced, and high prices ensue? All these are as neceſsary consequences of the circumstances indicated above, as that a shadow should be produced by the light of the sun. What are to be the consequences of all this, it is more easy to foresee than pleasing to contemplate. Yet, aſsuredly, it behoves those who have a sincere regard for the welfare of the community not to shrink from an inquiry because it is unpleasing, if but a poſsibility of salvation remains. In the present state of this country, it is vain to think that any thing can remove the distreſs under which the country labours, unleſs it be that of drawing from our own fields once more abundance of food to support the whole of our own people; for, until this be done, all attempts to produce either moderation of prices, or steadineſs of markets, must prove futile; without these, manufactures cannot long flourish; and, if manufactures are vibratory and unsteady, the poor's rates must increase, so as not only to give a still greater check to agriculture than it has yet experienced, but to depreſs respectable householders, who at present struggle hard for a moderate subsistence, and who, though they now pay to the poor's rates, must soon become themselves of that unhappy claſs of beings who draw their subsistence from the poor's funds. It is painful to dwell upon this picture; but it is a fact too true, that the moment a person finds himself reduced to a neceſsity of accepting parish alms,

the energy of his mind is broken, the spirit of independence is lost, and every stimulus to industry is withdrawn: he becomes from that moment a useleſs member of society, a perfect wen on the universe, and is not only too often a useleſs member, but a nuisance to the community; for when the mind is once debased, the heart becomes corrupt; and each individual then acts as a leaven that tends most powerfully to contaminate the whole maſs. When society shall be reduced to this state (and how quickly we are approaching to it every considerate person plainly sees) it is obvious that every person who has any property at all will find himself preſsed to withdraw from this country as quickly as poſsible, and remove himself elsewhere. Poverty and want will then be the lot of the few who shall remain; and the nation at large must sink into the same state of debility that Spain at present exhibits to the world; who, from causes similar in kind to those that now operate among us, has been tumbled from a higher state of exaltation than that which we now occupy, to her present state of humiliating debasement. Reverses of this kind seldom come at once. The evil is scarcely felt at first; nor do inconsiderate persons mark when those seeds are sown, which, when they attain to maturity, are to be productive of greater evils than it is poſsible then to remove.

Impelled by these considerations, I have thought it a duty to controvert the position of our author, "that, notwithstanding the rapid increase of tythes during the last fifty years, English agriculture has continued to flourish beyond comparison with any other period, *or with any other country in Europe*," and to show that it is an aſsertion hazarded at random in both respects, and is clearly proved, by the decisive testimony

of undeniable facts, to be directly the reverse of the truth. That every shadow of doubt, however, may be removed from the minds of the reader respecting the comparative progress of agricultural improvements in Scotland and in England for the last fifty years, and the influence that tythe must have had in producing these effects, I shall beg leave to state two more facts that will elucidate this matter in the clearest manner. The first is already well known to the public, and to thousands who have seen it; the last, as of a more private nature, is not so generally known; but instances of a similar nature are so frequent in that country, that no one who has ever resided there will see any thing in it that is uncommon.

In the neighbourhood of Aberdeen in Scotland there are many considerable tracts of cultivated land of the following description, but one in particular very near the town in such a state of prolificacy, that it lets at from three to five pounds an acre (some of it higher) which about thirty years ago was such an unprofitable waste, that it would not perhaps have let in its then state at more than one penny per acre; so that every acre of it now produces more food for man than several thousands of acres of it could then have done. Each acre of that ground required a greater outlay upon it before it could be made to produce a crop of any kind, than would have purchased a hundred times over the fee simple of the land in any county of England that I have seen. It was purchased and improved by monied men (not by farmers properly so called) with a view to improve it; and the success has shown that it was no unprofitable speculation. It is certainly unnecessary for me to add, that not one acre of that ground could ever have been improved at all had tythe

in any way been demandable from it; of course, that no such improvement has ever been made, or can be made in England, while tythe continues to be exacted from land. This circumstance I had distinctly stated, and particularly illustrated by a variety of particulars, in Eſsays on Agriculture, Vol. III. page 257 to 265; which, as they have been read by Mr. H. cannot be unknown to him.

The other fact is this. I know a farm in Berwickshire that about fifty years ago was rented at thirty pounds a year, which was then reckoned more than it was worth; it is now let at FIVE HUNDRED pounds, and that rent is now reckoned so low that every person who knows it has no doubt that when the lease expires, a few years hence, it will then give from seven to eight hundred pounds a year: nor has this increased value been produced by any extraneous circumstance, such as the rearing of a town, or erecting a large manufacture in its neighbourhood; for in these respects its circumstances are not at all altered; but merely from the progreſs of agricultural improvement: for, at the first mentioned period, the farm consisted of barren heath alone, which, without the powerful aid of unabating industry, and a continued outlay of capital, never could have yielded the smallest increase of produce; and it now affords, in the greatest abundance, crops of every sort that is suited to the climate; and all this improvement has been effected by the industry of the tenants alone, without having cost the proprietor one shilling of expenditure. I condescend upon this specific instance merely because the particulars of it are known to me; but improvements of a similar sort, though not perhaps to an equal *degree*, within the same space of time, are common in the Lo-

thians and neighbouring counties. Such are the exertions of that claſs of men whom Mr. H. has chosen to represent as poor and oppreſsed, and whose agricultural progreſs has been, as he says, so much inferior within the period mentioned to that of the farmers in England! Had Leicestershire been under the hands of such farmers for the last fifty years, and had they been freed from tythes, and other oppreſsive restrictions that are not known in Scotland, the produce of that county in corn, instead of having dwindled into its present insignificance, might have been augmented to fifty times its present amount; though it could at the same time have supported an equal number of beasts as it does at the present hour. Let those who affect to make light of the operation of tythe reflect upon these momentous truths; for it is undeniably certain, that, if tythe had been demandable in Scotland, not one inch of the land above specified could ever have been brought into cultivation; but that, on the contrary, had that tythe been more rigidly exacted than usual, other lands which had formerly been in corn, instead of advancing by a rapid progreſs of improvement to a state of higher productiveneſs from year to year, must have experienced a state of degradation similar to that of Leicester and most other counties in England. Yet, that the progreſs of improvements in Scotland, rapid as it must be admitted they have been by every person who is well acquainted with the state of that country, has been greatly retarded, compared to what it might have been, by other circumstances that tend to depreſs agriculture in Britain, is a truth that will be acknowledged by every intelligent person; which is the more to be regretted, as so few among those who have it in their power to mitigate these evils turn their attention

towards them. And this is no doubt augmented by the delusive declamations of many persons who take it upon them to write on a subject that they either do not understand, or are willing to lay hold of popular prejudices to blind the understanding, or make bold and unfounded asfertions to pervert the truth. It is much to be regretted, in particular, that the interests of the clergy should have been in any way connected with tythe; because it has such a natural and almost necefsary tendency to decrease their respectability among the people, and thus to diminish their proper influence upon the community; while at the same time it tends to promote a spirit for cherishing another sort of influence among the clerical order as a body, that is certainly not beneficial, if it be not hurtful, to the public welfare. Thus are the talents of a body of the most respectable clafs of literary men in the kingdom, not only abstracted from the elucidation of truth in regard to a question that they could more properly illustrate than any other; but a temptation is laid in their way, that has a tendency to bias their judgment, and, in some instances at least, to induce them to exert their influence rather to disguise the truth than to promote it. A few observations upon this head, that are suggested by the pamphlet under consideration, shall be concluded in the next Number of this work.

Travels of Viator in Scotland.

[*Continued from page* 278.]

VIATOR thus proceeds, "We had now travelled about two miles in an old worn path-way through a bleak kind of hilly country interspersed with a few uninclosed corn-fields, when the sky began to be overcast, giving strong indications of an approaching thunder-

shower. My guide now proposed that the horses should be sent forward to a small public house a few miles on the way, where they could get a feed of corn, while we ourselves should take shelter from the shower in a small cottage not far off, to which he could conduct me by a foot-path that was inacceſsible by horses. To this proposal I readily acceded. The horses were sent forward, and I followed my guide in the path he had proposed.

" I expect, said William (my guide's name was William Wright) that you will be much pleased with the cottage I am to show you; for there at least you will see objects that I dare say will be quite new to you. This cottage (he continued) is occupied by the mistreſs of a school, a woman who is highly respected in this neighbourhood on account of many valuable qualities. Her history is nothing extraordinary, yet you may perhaps be pleased to know something of it before we see her. To this I aſsented, and he thus went on:

" Mrs. Ford, for that is her name, was the daughter of a clergyman. The old gentleman her father had the misfortune to live in worse times than the present, for he died before the *widow's fund* was established, and his widow was left in very narrow circumstances with two daughters to support: but she was an excellent woman, the girls were deserving of such parents, and God bleſsed their industry, so that they were enabled to live in comfort among themselves, and beloved by all their neighbours.

" Although I was much interested (says Viator) in the beginning narrative, I could not help interrupting him to ask what it was that he called the *widow's fund.* He expreſsed much surprise that I did not know it; " for I thought (said he) that all the world

had known it. So many cases of the same nature with that which I have just stated had occurred, that it affected the minds of all the clergy in Scotland so much, that they frequently considered whether any means could be devised for moderating this distrefs. At length they contrived a plan for doing this, which met with the approbation of the general aſsembly; and one of their members, an eminent man, called the Rev. Dr. Webster, was engaged to make calculations and estimates of the amount of jointure that would accrue to their widows, supposing each clergyman should contribute annually one guinea to this fund, and so on for any larger sum. He called for information from all the ministers of the church of Scotland, and, having obtained authentic statements of the number of widows existing, the time they had been in that state, the number of years the clergymen had enjoyed their livings, and every other fact that affected the question, he made out a calculation, by which he showed, as I have been told, that if every clergyman should contribute one pound a year to this fund, there was reason to believe that they could give above five pounds a year to each widow; but as he could not be certain that his calculations would prove exact, he advised that they should not at the beginning give quite so much. Upon this principle an act of parliament was obtained about fifty years ago; by which it was ordained, that every clergyman from that time forward should be obliged to pay annually a certain sum into this fund; in consequence of which his widow, if any such survived him, acquired a right to obtain a certain annuity for her life out of that fund; and the children, if any, under certain circumstances (which I cannot particularly specify) were entitled to receive

a certain sum in money, once paid, to be divided among them. This is called the *widow's fund*; and the benefits that have been derived from it are inconceivable; as, instead of want, to which they were often subjected before, the widows of clergymen are now enabled to live, with economy, in a decent state of respectability. In answer to my farther queries, I learnt, that the annuities are arranged in three classes, into one of which every clergyman must enter within a year from the day of his inauguration, he being at liberty to choose the higher or lower, as best shall seem to suit his circumstances and prospects; but having once made that choice, he must abide by it, and can on no account be ever admitted into any other class. In consequence of the rules thus originally established, which have been in no respect deviated from to the present hour, experience has established the accuracy of the calculations to a degree that could not have been expected; for, after the institution had been in force for more than thirty years, our minister (this is the name he always gave to the parson) assured me that the actual amount of the fund at that time differed not more than five pounds from its estimated amount; so that there is now a great many thousand pounds of excrescence; and it is in contemplation soon to obtain an act of parliament to enable them to grant a higher annuity than has yet been given for the same annual payment."

"I could not enough admire the beauty and simplicity of this beneficent institution; nor could I help wishing that something of the same sort could be adopted in respect to the clerical order in England (as well as others who have lay offices for life, whose salary must be discontinued at the death of the hus-

band). For, as great numbers of that respectable body of men have little patrimonial income, they cannot make a proper provision for their widows and children, even when they have prudence enough to appropriate a certain proportion of their income to that purpose, till after they have enjoyed their living for *many years*; not to mention the chance that even this degree of foresight may be neglected. Whereas were they subjected to the *necessity* of appropriating thus a proportion of their income for that purpose, this duty could never be neglected, and the provision for the widow from that moment would be insured against the posibility of accident from deranging it. But when I came to compare the stability of the clergy in the Scottish church with the frequent changes and perpetual expectations of rise in the church of England, I soon perceived that on this account difficulties must occur which would render any calculations much more uncertain in the one case than in the other; so that, however much a similar institution may be wanted among us, I much fear that we can scarcely hope ever to see it.

" My guide (resuming his story) said, the respected widow and daughters lived thus in peace and harmony for several years; but, the eldest daughter dying, the mother, now far advanced in years, fell into a state of decline, that in a short time brought her to her grave, and left the youngest, who is the lady to whose house I now conduct you, in the nineteenth year of her age, in a most helpleſs situation. But it chanced that the school-master of the parish in which they lived, who was a young man of promising talents, and excellent dispositions, of the name of Ford, took a fancy to the maiden, who was by all accounts a charming young woman; and, though he had but a small income him-

self, he paid his addreſses to her, and they were married. They felt the neceſsity of exerting themselves as much as poſsible, in order to provide a moderate income for a family that might be expected, and with a cheerful aſsiduity they cordially united their joint efforts. His school, in consequence of his good behaviour, soon acquired celebrity. The young couple obtained the favour of all the parish and neighbourhood. Gentlemen at a distance wished to have their sons at that school, and prevailed on Mrs. Ford to take a few boarders. Their charge was moderate, and the economy of the family such as to give the highest satisfaction to the parents; but their house was too small to admit of more than a very few. The proprietors of the parish, and the parents of some of the boarders, gave some small sums to enlarge the house; and an addition was made to it, partly at their own expence. They were thus enabled to take more boarders, and they lived for some years in a very comfortable state; when, alas! poor Mr. Ford, in the thirty-eighth year of his age, was carried off by a fever, leaving his helpleſs widow with a son and two daughters, in circumstances very far from being affluent, as you may easily conceive. She had, however, behaved so well in her married state, and was indeed in all respects so pleasing a woman, that the school-master who succeeded, though a very young man, wished very much to marry her; she, however, declined that and several other offers of the same sort, being anxious, as she said, to devote her whole attention to the care of the beloved infants of a man whose memory she could never cease to venerate; and she hoped that God would bleſs her exertions for that purpose. She had the mis-

fortune to lose her son when he was about seven years of age, after which she retired with her two daughters to the cottage to which I am now conducting you."

"Here (says Viator) I was again forced to interrupt the narration of my lively companion. He had mentioned the *parish school-master*; and I was desirous of knowing what was denoted by that phrase. I asked William if it was a *free* school which had been established in that parish that he alluded to by the phrase. He was at a loſs to know what I meant by a *free* school; and it was not till after I had told him, that by that term I meant a school which had been endowed by some charitable person, on the condition that they should teach certain descriptions of scholars *gratis*, and having asked several other questions of him, that I could collect the following particulars respecting the parish schools of Scotland; an institution to which that country, perhaps, owes some of those peculiarities which characterise its people among other nations.

In every parish throughout the kingdom a provision is made for a school-master as regularly as for the parson. A house and convenient offices, in all country parishes at least, is built for the parson, and a school-house and house for the school-master, at the expence of the proprietors of the parish. To the last also is attached a suitable garden, and a small salary in money, usually, as I could gather, about five or six pounds a year. The person appointed to this office is called the parish school-master, and is under an obligation to open a school for the purpose of instructing such of the young children in the parish, as their parents choose to send thither, to read and write, and cast accounts, as well as to read the Latin language

if they so incline. For this he is entitled to demand certain fees, which vary in different parts of the country, but all of them extremely low. In the parish of Dollar, my guide told me, no more than fourteen pence a quarter could be demanded for each scholar for being taught to read; half a crown for writing and accounts; and the same for Latin; though it is customary for the parents to pay five shillings for the last; and very common among those who are not of the lowest clafs of labourers, to make some presents occasionally to the teacher, over payment, as a testimony of good-will, when the school-master gives satisfaction. In this way, if he be afsiduous, and well-beloved by the parish, he can make a moderate living among them, but never can rise so high as to be able to dispense with the drudgery of teaching. It is owing to the universality of this establishment, and the modicity of the school fees, that education is brought within the reach of the lower clafses of the people in Scotland so universally, that unlefs it be in the Highland districts, where many of the parishes are of very large extent, there is scarcely to be found a single individual any where who has not been taught to read; and few among the young persons, especially boys, who cannot write and cast accounts also. Most of those, however, among the clafs of labourers are taught to write after they are grown up, so as to be able to pay for it themselves; it being a practice very common to have an evening school for that purpose, where none but such young men do attend. To this institution also we must ascribe the peculiarity, that here you can scarcely meet with a farmer's son who does not understand a little of the Latin tongue also;

though it must be admitted, that their knowledge in this last is in general so slight as to entitle them to no other epithet than that of smatterers in the language. But the lower classes universally read the Bible with ease, and study it with unremitted attention, so as to be acquainted with its contents in a much more accurate manner than some of those in other nations whose duty it is to teach and expound the scriptures. There is no family above the rank of a labourer that has not a family Bible, which usually descends from father to son for several generations, and is of course preserved with care, and only opened with reverence at times by the father of the family, when he reads and expounds it to the younger ones and servants, and performs family worship, each individual at the same time making use of his own particular Bible. It is easy to conceive, that a practice of this sort, being very general, must have a great effect on the manners and conversation of the common people; and all this must be originally traced in a great measure to that simple institution which I have just noticed. The income of the parish school-master is usually augmented in some degree by his being appointed to the office of sefsion (parish) clerk, with a small salary annexed to it, besides certain fees of office, which, though small when individually considered, amount to something when united into one aggregate sum.

"As we proceeded in our walk, my attention was arrested by a phenomenon that appeared to me of a very awful and interesting nature; so that I was obliged to stop and contemplate it with a fixed attention. Two herds of cattle, consisting of from twenty to thirty head on each side, each pasturing upon their own native fields, had by chance approached so near as to be

within the ken of each other. No sooner did the one herd observe the other, than the bulls on each side advanced before the rest growling, as it might be called, and sending forth a deep and hollow roar of mutual defiance. They advanced slowly with their heads low in a menacing aspect, all the others following in the same manner. As they approached nearer to each other, their roar became more loud, and their attitude more menacing; and, while they bellowed with deep and horrid murmur, they tore up the earth with their fore feet, and toſsed it high in the air behind them; sometimes also tearing it up with one of their horns. The whole herd on each side imitated the same actions, and the mountains re-echoed with the deep and loud bellowings, so as to excite a sensation of horror the most tremendous that I had ever experienced. This sensation was at the present heightened by the dark and gloomy appearance of the clouds which settled, as it were, above them. Fragments of sod, toſsed into the air on all sides, exhibited, in falling, the appearance of a shower of a singular sort. The elements themselves seemed to be at war. The roar was loud and various. They all rushed into battle, however, breathing mortal defiance to each other; and the universal destruction of the whole seemed to be unavoidable. The moment they engaged all bellowing was at an end. They were too seriously engaged to think of menacing sounds. The struggle was long; the exertions of each individual were strenuous, and carried on with the highest poſsible degree of obstinacy. When any one at last was forced to give way to the superior power of his opponent, it seemed to be at that time impoſsible for the weakest to avoid destruction; for the most powerful, after having pushed

back his adversary, never failed to attempt to gore him in the side with his horns with all his force; but the danger was evaded by the weaker animal instantly giving up the contest, and receding as nimbly as poſsible from the thrust. When once conquered, he immediately owned his inferiority by yielding to the conqueror the most submiſsive obedience, with which the conqueror seemed to be entirely satisfied; and from that moment all animosity between these two was at an end; for, whenever they met, the one no sooner claimed superiority than the other readily allowed it. The beast, however, who was conquered by one individual, did not on that account deem it neceſsary to yield obeisance to others of the same party. He attacked in his turn another whom he considered as his inferior; and, if the superiority was not acknowledged on one side, another battle ensued. The contest, in short, was solely between individual and individual; and, although the two herds arranged themselves at first on opposite sides, as if with a view to protect each other, and try their united strength, it was soon very evident, that no idea of that kind ever took place. Each herd had previously settled the authority among themselves; and every individual among them had already ascertained before that time the station that belonged to him; and he knew as well those who were under his authority and above it, as the higher and inferior orders in a regiment do their respective ranks, and exacted and obtained the deference due to him, and performed the obeisance due from him to others, with the same alacrity; but from very different views in the two cases. The cause of the distinction among men is to add greater force to their united efforts; to make the party, in short, more powerful, without aim-

ing at individual superiority. Individual superiority alone is all that the animals aim at; and, this once attained, every cause of contention is at an end, and the war is entirely finished. In the space of half an hour this war, which seemed to threaten destruction to the whole of the parties engaged, was entirely at an end; and all the individuals were as quiet and peaceable as they ever could be, and associated together in harmony and peace. Nothing can be more natural than the whole of this procedure, when it is coolly reflected upon; yet, until it was forced upon my attention by the singular rencountre that I have specified, I frankly own, that this particular had never attracted my notice in the smallest degree. I was therefore happy in having an opportunity of observing this singular trait in the natural-history of this very useful domestic animal.

"We now proceeded forward toward the place of our destination; but were soon stopped for a short time by my guide, who, having fallen in with an old acquaintance, could not prevail with himself to proceed till he had inquired the state of his health. This was an old man of very interesting appearance. His locks were frizzled, and of a bright white that indicated great length of years; yet there was a healthy glow in his cheek, and an amplitude of shoulder, that exhibited unequivocal proofs of the remains of great bodily strength; he was digging a small patch in a garden, for the purpose of planting a few greens, as he said. When William had ended his kind inquiries, I could not help asking what the person was whose appearance had struck me so much; though I soon perceived that this was an unnecessary precipi-

tancy on my part; for my guide was just beginning to tell me of his own accord.

"The man that you have seen," said he, "is now in the ninety-sixth year of his age; he was born in the cottage just by, which he inhabits at this hour; and it has been occupied by his predeceſsors, for aught that we know, for many generations backward, all of whom were labourers, as this man also has been. His name is Thomas Brown; but he is now more generally known by that of *Old Thomas*. He has had a numerous family of children, all of whom have been either servants or labourers like himself, and most of them are now dead; but their descendants, I believe, amount at present to few short of one hundred. The youngest son, now about fifty years of age, he retained in the same cottage with himself, of which he was to be the poſseſsor, and heir of all that should belong to the father at his death; for such has been the general practice of this family. The son has been married now for about thirty years; and the three generations; that is, the parents, children, and grand-children, have lived in one family all that time in the utmost harmony. The wife of the old man died about ten years ago; before that time it was scarcely known that he had ever lost a day's work through ſickneſs or any other cause. Since then, however, he has been sometimes a little ailing; yet until the last three years his labours were scarcely ever interrupted above a day or two at a time; but of late he has been sometimes obliged to stay at home during hard frosts in winter for a month at a time; and last winter he was unable to resume his labours for full six months. And even now, during the fine weather in summer, he complains that he is not able to do a day's work that is worth

half the wages his employers are willing to give him; which grieves him so much, that he can scarcely be prevailed on to go to any one; rather choosing to do some little job that he is able to accomplish at home."

"I wished to turn back to have some conversation with this venerable old man; but, William seeming to be unwilling, I desisted. And does this very old man (said I) stand in need of no parish asistance?" "God forbid (said William) that it should be so! How can you suppose that that could be the case, after I had told you there were probably a hundred of his own descendants living! That would be deemed such a stigma on the whole, that not an individual among them could ever show his face in this country if they could submit to such a shameful disgrace. No. So long as there is a person among them under the age of decrepitude, and who enjoys ordinary good health, no such thing would ever be tolerated here: besides, the old man himself has always taken care to lay by so much of his earnings as would, I make no doubt, be sufficient to preserve him from suffering want for several years to come: and were not that the case, his son Watty (Walter) who lives in the family with him, would allow no one but himself to look after his aged father while he is in existence. It is not a small calamity that brings a person upon the parish in this country."

"The whole of this rhapsody, which was uttered with a rapidity unusual even with William, astonished me exceedingly. 'And have you no poor upon the parish then,' said I? 'For if you do not deem a labourer of ninety-five years of age a fit object of parish charity, where will you find any?' "There are, it

is very true, some poor who receive alms from the parish (said he); but these are few. They consist chiefly of old people, who have never been married, childless widows, and others of a similar description, who have survived their near relations that were younger than themselves; for, as I have already said, no child who had the smallest respect to character would ever submit to see either of his parents brought upon the parish while he had health and strength to earn an ordinary day's wages. It would even be accounted disgraceful to any near relation, who was not in very indigent circumstances, to allow any of his kindred to go upon the parish." "Then," said I, "your poor's rate must be very light." He scarcely understood what I meant by *poor's rate*; but when I explained it he said, that he had indeed *heard* of such a thing in some distant parts of the country; but that here no such thing is in any respect wanted, as the ordinary poor's funds are altogether sufficient to answer every purpose that is required; and more: for that there are some hundreds of pounds of the poor's money, in most of the adjoining parishes, lent out at interest, being an accumulation of savings. I then asked, if they had no poor's rate, what were the ordinary poor's funds that he had mentioned. He told me, that it was a custom invariably adopted throughout all Scotland, as he believed, to collect voluntary alms each *Lord's day* (Sunday) at church, where divine service is performed: that this is generally done by placing a pewter bason in the porch through which the people usually enter the church, into which bason every one is at liberty to throw such a piece of money as his inclination prompts, or his circumstances permit him to do; but that it is by no means compulsory on any one: that

such voluntary oblations are carefully carried by one of the elders (a sort of lay afsistants to the clergyman), and deposited in a strong chest, from whence it can only be taken in the presence of the clergyman and the kirk treasurer (each of whom has a separate key to different locks), accompanied by the parish clerk, who enters the amount in the parish register: that, besides these voluntary oblations, there is usually a part of the church which is appropriated to the poor, the seats of which are let; and the rents drawn for these is carried to the same fund: that farther, there is usually one or more mort-cloths bought with the poor's money, for which each person who uses it pays a certain stipulated fee, which is also carried to the same fund: that some other devices of a similar tendency are carried into practice in different parishes; and that all these items, together with occasional voluntary donations from pious persons, and interest of money lent, constitutes the ordinary poor's funds; and that the whole of the monies so collected is put under the immediate management of the minister (parson) and elders of the parish, who, without fee or reward, distribute it to the poor according to exigences; these accounts being subject in the first instance to the inspection and controul of every heretor (proprietor) in the parish, afterwards to the *synod* (a church judicature consisting of ten or twelve parishes), and from thence, in case of challenge, to the general afsembly, or by appeal to the court of sefsion. And these funds, being thus managed with great integrity and economy, are found to be altogether adequate to the purposes required. "What a blefsed institution is this," said I to myself. How fortunate was it that I departed from the common routine of travellers! Had I not done so, I might

have travelled through Scotland fifty times without having heard one syllable of these very interesting particulars!"

Concluding remarks on the Symbolic Character.

AGREEABLE to the intimation given to *Philo Biblos*, page 320, respecting the symbolic character, I have made it my business to go to Sion College library to try if I could find the book on the universal character, by Cave Beck, as quoted by him from the catalogue; which I did find there exactly as it is described. I ran it over in a cursory manner in order to discover the plan on which it is constructed; and found that it is upon the very same principle with that which I had devised; but the mode that has been adopted for accomplishing the same end differs considerably from mine; nor does the idea seem to have been carried so far as I have done.

The plan that Mr. Beck has devised is, to begin a vocabulary of words in alphabetical order, denoting the first word by the arabic numeral 1, the second word that occurs by 2, the third, in the order of the alphabet, by 3, and so on to the end of the alphabet, continuing the numbers in regular progression to the end; prefixing to each word, or rather the number denoting that word, a letter to denote the part of speech, whether noun, verb, adverb, participle, or preposition. In this grammatical arrangement he has followed the plan of the common Latin grammars that are in the hands of every school-boy, ranking adjectives under the general title noun, and making besides several other distinctions of nouns, verbs, &c. which I think

it unneceſsary for me more distinctly to specify in this place.

A tolerably complete idea of it may be obtained by reading the following directions that are prefixed to the book:

The scheme of art, which is to be learned by heart, after the grammar is read over.

" Nouns are known by the letters p, q, r, x, set before the arithmetical figures.

" Instead of cases, the vowels a, e, i, o, u, are set after the nouns, participles, and consonants.

" The feminines are known by the letter f added to the syllabical cases.

" The vowels a, e, i, beginning a syllable, and having the consonants b, c, d, f, g, l, set after them, expreſs the three persons of the pronouns, and the six tenses of the verbs.

" The consonants l and m, prefixed to those syllables, make the imperative and potential moods.

" The infinitive present being writ with plain figures, without any letter or mark before them, is made the root of all.

" The paſsive voice is distinguished from the active by a line drawn over the head of one of the figures.

" The plural number is known by an [s] set after the figures.

" Numbers are distinguished from words written with the same figures by a croſs.

" Derivative abverbs have the letter t set before their figures.

" Whatsoever syllable begins with s or t, is a conjunction or syllabical composition."

From the enumeration of these rules, a tolerably

precise idea may be obtained of the nature of this invention; and some notion may be also obtained of the advantages and deficiencies to which this proposal is liable; but with regard to these it will not be expected that I should here enter into the consideration of them at large.

In running over the pages of the vocabulary, I could not help remarking that, instead of attempting to give greater precision to the language, which I have considered as the chief recommendation of the plan that I proposed, the author has rather aimed at the opposite extreme, viz, that of designating by the same figures words which are nearly, though not exactly, synonymous.

The author mentions, that he intended to publish a small treatise, in the nature of *Comenius's Janua*, set forth with the vulgar language on one side, and the character on the other, which was promised in a few months. Can any of my readers say, whether this was ever published, or where it may be met with if it was? I am unacquainted with the nature of the *Janua* here referred to.

In one particular, indeed, Mr. Beck's plan differs entirely from that which I have had the honour to propose; for, instead of allowing every person to read the writing in the words of that language which he has been accustomed to use from his infancy, Mr. B. attempts to affix a particular *sound* to each of the nine digits, so as in this way to make it constitute at the same time a particular language, as well as a peculiar mode of writing. This peculiarity, however, according to my idea, would totally counteract all the good that might otherwise have resulted from the scheme, by rendering it complex and intricate, and consequently

difficult of attainment, instead of poſseſsing that extreme simplicity that I have aimed at, and which, in my own opinion, constitutes the highest excellence of the plan. Let any one but attempt to form an idea of the embarraſsment that would have been felt at the beginning, when an attempt was made to introduce the Arabic numerals, had we been obliged not only to learn the meaning of the figures themselves, but to be at the same time perplexed with a set of new names which conveyed no idea to the mind; compared to that which was felt when these unknown figures were explained by the names of numbers with which we had long been familiarised, and which conveyed precise ideas to the mind the moment these names were heard; and he will then have some notion of the embarraſsment that would be experienced by this refinement of Mr. Beck; a refinement which is the more to be regretted too, in as much as it is entirely unneceſsary, and can answer no good purpose whatever. Mr. Beck's plan, with this refinement upon it, is, in short, a mode of writing that cannot be called in strict propriety either symbolical or alphabetical; it is in fact an attempt to form a new language in a manner totally different from any that has hitherto been devised, and that can poſseſs no one advantage whatever peculiar to itself. The written language is at first entirely of the symbolic kind, founded upon the alphabetic, without order, selection, or arrangement, farther than an adherence to the alphabetic arrangement respecting *one* language can be called such; and then upon that is grounded a new alphabetic language to be pronounced by all nations; so that in proportion as they use this they must forget their mother tongue.

After all, however, this must be admitted not to con-

stitute an essential part of Mr. Beck's original plan, but is a mere adjunct to it, which ingenuity had suggested, and which a fondness for refinement had induced the author to adopt, without allowing himself time duly to consider it. The system itself would suffer no derangement were this particular to be entirely suppressed; and I can have no doubt, that had the author been encouraged to attempt to carry his own plan into execution, he would soon have seen the propriety of abandoning it entirely, as well as the necessity of adopting something else for the basis of his symbolic character, than the common arabic numerals, which has evidently been the very first idea that suggested itself to his imagination. There is one plain inference to be drawn from this and the other proposals of a similar tendency that have been mentioned; and that is, the obvious facility with which a character of this nature might be formed; otherwise we cannot suppose that so many persons, who, in as far as I can judge, have borrowed none of their ideas one from the other, should have all been led to the same conclusion precisely, viz.; to see that a symbolic character might easily be devised, which could be employed as a medium for establishing an universal correspondence between all nations and kingdoms and languages on the earth. This is enough to satisfy me that the thing will one day be accomplished. The arabic numerals were known to certain contemplative men in Europe, there is good reason to believe, some hundreds of years before they were introduced into general practice; yet they at last forced their way through the mist of prejudice: and so will this obvious improvement.

Acknowledgments to Correspondents necessarily deferred.

37.

MARCH 1802.

RECREATIONS, &c.

N° 7. Second Series, Vol. II.

Remarks on Mr. Howlett's Pamphlet on Tythes.

[*Continued from page* 460, *and concluded.*]

BEFORE I take into consideration the effect of tythes on the clerical influence among the people, I may be permitted to make my acknowledgments to Mr. H. for the honour he has done me by a quotation which he has made from my Eſsays on Agriculture, Vol. III. respecting tythe; for which he is entitled to my thanks, because it will diſseminate the knowledge of that article among some persons who might not otherwise have had an opportunity of reading it. I have only to regret, that the paſsage in question should chance to be of far leſs general importance than those that precede it, which he has wholly omitted, for reasons, no doubt, of great weight, that are best known to himself. If those paſsages, however, had been quoted by him, they might have superseded the neceſsity of the illustrations that I was induced to give in the last Number of this work respecting the state of agriculture and the condition of farmers in Scotland, when compared with those in England; for the same facts nearly are there stated; and the effect of

tythe in producing the diversity in the agricultural state of these countries is there enforced by reasoning still more conclusive than that which was adduced in the preceding Number. If, then, he was to establish the principle, that *tythe neither has been nor ever can be any material obstruction to agriculture,* why, it may be asked, did he not disprove the decisive facts there stated, and thus invalidate the reasoning that is grounded upon them (for he must have read the whole) in preference to that of laying hold of some collateral inferences only, which, though they should be proved erroneous, would still leave the general conclusion unimpeached? In that case, it is true, indeed, he could not have inserted the quotation which he has adopted from the account of Mid-lothian, and he must of course have been precluded from drawing the inference from it that he has done; for he could not have had the effrontery to affect to believe that which was even not authorised by the one quotation, when it was so directly contradicted by the other; and thus must have been lost, what he may perhaps deem one of the finest paſsages, and the most decisive arguments, in his work.

The quotation that he has made from my work is merely calculated to show, that the drawing of tythe tends to affect the interest of the land-owners in regard to one particular, the abstracting the forage from the premises, and thus diminishing the quantity of manure on a farm, respecting which they have discovered much anxiety (and which Mr. H. himself unequivocally admits to be the case, as we shall soon find) by precluding the farmers in their leases in most counties in England from selling, or otherwise disposing of, straw from their farms. This objection,

unimportant as it may appear when compared with others, our author has thought it worth his while to attempt to invalidate, not by disproving the fact indeed, but by the following reasons; which, that I may not misrepresent them, shall be carefully transcribed.

"Now," says he, page 20, "As to the manure arising from tythes taken in kind, what becomes of it? Is it lost? It is only transferred from the lands of one man to those of another. The grounds of the farmer are not more *impoverished*, than those of the tythe-man are *enriched*. Or, if he has no lands of his own, or gets more manure than he wants, he sells it for the use of his neighbours. Although, therefore, *the landed proprietor is undoubtedly thus far injured* [this was the only point alluded to in the paſsage], (if it can be properly so called) the public is equally benefited in the one case as in the other: and so, upon the whole, agriculture receives no sort of discouragement."

This, it will be admitted, is an argument of singular convenience, that might be applied with the happiest effect in many other cases. Thus, a highway-man might prove by it with undeniable certainty, that he had been guilty of no crime in taking the purse of his neighbour. "What has become of the money?" he might ask. "It is not lost. It is only transferred from the hands of one man to those of another. The wealth of the person robbed is not more *diminished* than that of the robber is *augmented*; the public, therefore, sustains no injury by the case; what right then has the public to prosecute me!!!" If the one argument be good for any thing, the other is certainly equally valid. Nay, on many occasions, much more might be urged in favour of the robber. "I am

poor, he might say, and you are rich; so that the little I take will benefit me very much, while it will scarcely injure you at all. My family was starving, my little ones were in want of bread, whilst thou wert wallowing in plenty, and wasting more in a day upon uselefs dogs and horses, than would support my little ones for a month; the public, therefore, is not only not injured, but highly benefited by this transfer of property." But how would a judge or jury receive such a plea? The argument of Mr. H. is still more fallacious than the above. It certainly is true, that if robbery be illegal, and the laws be duly enforced, a transient robbery will prove no material obstruction to the exertions of industry, and every individual will make strenuous efforts to obtain as much money as he fairly can. But, were robbers *protected by law*, this would not be the case. "It is impofsible for me to benefit by wealth," would every one say; "why then need I exert myself to acquire money?" Industry would thus be repreſsed, indolence would succeed; and the robber would, in the end, perhaps have reason to complain that his profeſsion was scarcely worth the following.

That there are countries where robberies, though not authorised by law, are in many cases not punishable by the law, is undeniable; and in these countries the effect has been found to be precisely as is here stated. Industry is totally annihilated. That robbery (by which I must be understood to mean the forcibly depriving a man of his property; that is, of goods that have been fairly acquired by his industry or labour, or purchased by his own money,) is, in certain cases, authorised by the laws of Great Britain itself, is undeniable. In this manner an excise or cus-

tom-house officer is authorised to seize and appropriate to his own use goods of a certain description wherever he can find them. In the sense of the word above given, this must in strict propriety be called a legal robbery; although, in common language, with a view to distinguish it from that kind of robbery that is punishable by law, it is called *a seizure*. If we inquire into the reason for authorising this species of pillage, we shall find that it was intended to operate summarily as a *punishment* for a manifest transgression of an established law of the land, and with a view effectually to *discourage the pernicious practice of smuggling*. On this principle, and on this alone, can the law, authorising this practice, be reconciled with the principle of justice. In other cases of a similar nature, robbery may be authorised by law; but in *no case* can it be done with the smallest appearance either of justice or sound policy, unless where it is inflicted as *a punishment for transgression*, and with a view to repress practices that are plainly *injurious to the state*. Let the law, authorising the exaction of tythe, be tried by these rules, and mark the conclusion. The corn that is reared by the farmer has been procured by the outlay of his own money, and labour, and industry. It is, therefore, as much his sole property as any other goods of which he can ever be possessed. No one but a robber, therefore, can forcibly deprive him of any part of it. On what principle can the law with justice give any one authority to seize it? It cannot be inflicted on the farmer as *a punishment*; for he has transgressed no law, nor committed any crime. The rearing of corn is not only not forbidden by law, but it is admitted to be the most beneficial business that can be followed in the state.

This law, then, clearly contradicts the first principle of justice: nor is it lefs *impolitic* than unjust; because, like every other authorised robbery, it must of neceſsity *discourage* a practice that is not only authorised by the laws of this country, but is absolutely neceſsary to its very existence. Ought it not then to be abolished?

If it should be alledged, that rent must operate in a similar way in repreſsing the industry of the farmer, and be equally unjust and impolitic as tythe, this is denied. Rent is a stipulated acknowledgment, voluntarily given, for permiſsion to have the use of a valuable subject for a limited time, and is of course more or leſs in proportion to the value of the subject let. Tythe is in all cases a fixed thing, and must be the same where the expence of obtaining the same article has been a guinea, as if it had cost one penny only to procure it. Rent, when once fixed, must continue the same for the time agreed on, and must be as high to the most slothful as to the most industrious farmer: if the last should rear a hundred times the produce of the first, the rent must continue the same to both: it therefore becomes oppreſsive to the *indolent* only, so as strongly to stimulate to industrious exertions. Tythe to the sloven is nothing; to the industrious man alone it becomes oppreſsive; it therefore has a neceſsary tendency to repreſs industry, and arrest every energetic emotion in the farmer. If so, the *public must suffer* by it; nor will the tythe-owner be *enriched*; because the farmer, in order to prevent himself from being *impoverished*, will not rear, in the proportion he might otherwise do, the article that the law authorises another to take from him. This is precisely the evil that I wish to remedy. And the

case was as clearly stated in the paſsage which Mr. H. had read, but chose to suppreſs, as it is here done.

Mr. H. indeed, in a note, insinuates something like an attempt to show that landlords do not restrict their tenants from selling straw (and after admitting that "they are undoubtedly injured by it," this must surely indicate an extreme weakneſs on their part); or that it would be for the farmers loſs if they did. This is done by stating, that farmers *in the near neighbourhood of large towns* find great benefit by selling straw, and bringing back dung purchased with the price of it. This surely is a case that is such a well understood exception to a general rule, that no person in the least acquainted with the subject could ever think it neceſsary to specify it. Were a writer, in giving a general view of any subject, to stop in order to specify every poſsible exception to a general rule that is as obvious as the above, his work could never be brought to a close till long after he had disgusted every reader by detailing circumstances which were as clearly understood, from the beginning, by every one among them as himself.

The complaint that the drawing of tythe gives rise to so many disputes and captious interferences between farmers and the clergy as tythe-owners, and occasions at times actions so extremely unbecoming the character of a clergyman of the church of Christ, as greatly to lower them in the estimation of their parishioners, and thus to frustrate the very object for which the church was originally instituted, is so general, and so loudly re-echoed from all quarters, that it would seem to be equally vain to attempt to deny it, as it would be futile to adduce facts in proof of a proposition that is so universally aſsented to. Yet Mr. H. though he

dare not venture to deny the fact, is not, however, ashamed to gloſs it over in the following manner.

In order to show that the clergy, as a body, can give no just cause of offence respecting tythes, Mr. H. argues thus (page 19): "the clergy, before they enter the church, are, I suppose, *certainly* of the same common disposition and temper with the rest of mankind; for, do parents destine the most contentious of their children to a profeſsion, the leading duties of which are to inculcate peace, harmony, and friendship? Or, if it be the object of the children's voluntary choice, are they not likely to be of the best and most pacific inclinations? And after they are in the church, *is there any thing in the clerical profession of a tendency to corrupt or change these inclinations?* On the contrary, is there not every incitement that can powerfully operate on the human heart to strengthen and confirm them? While they retain the common spirit of a man, and the usual sensibilities of nature, *must they not feel a degree of shame to exhibit examples in direct opposition to their precepts?*" How beautiful are these speculations! We shall examine how properly they apply to the case.

Is it then perfectly ascertained, that no other object but a desire of propagating the pure doctrines of the gospel, weigh with those who enter into the church in inducing them to make choice of that profeſsion? Is it by none of them considered as a *business* which they adopt as being likely to turn out more *beneficial to them* than any other that the circumstances they are in puts within their reach? Are there none who adopt plans afar off for securing thus *good livings* for their children and dependants? Whence is it that the being appointed to a cure of souls comes to be reckoned

synonymous with that of obtaining *a living?* Are not such livings often *purchased by money?* Our author himself admits that this is a common practice (page 6). Is there no reason to think, then, that the men who do these things, will pay some attention to the amount of that living, and adopt such means of augmenting it as fall naturally within their reach? And is not an augmentation of tythe the most obvious mode that occurs of doing this? But every attempt to augment tythe is a most infallible mean of promoting parochial war instead of peace, and of destroying that harmony and friendship which ought ever to subsist between the pastor and his flock. Whatever his natural dispositions then may be, the situation in which he is placed, as soon as he becomes a parson, must make him feel a powerful stimulus to do that which, as a minister of peace, as a disciple of the meek and holy Jesus, he ought to study to avoid. When the question then is asked, "if there be any thing in the clerical profefsion of a tendency to corrupt or change these inclinations, or duties rather, to inculcate peace, harmony, and friendship?" I answer without hesitation, YES; the right which they then acquire to draw tythe in kind has a powerful tendency to do so, and thus to make them "*exhibit examples in direct opposition to their precepts.*"

One of the most obvious means of preserving the heart in its native purity is, to avoid temptation; and every minister of our holy religion is bound to pray four times a day at the least, when he performs his ministerial functions, that he may be *delivered from temptation.* With what propriety this prayer can be offered to the *Most High,* by men who are making every effort in their power to support a system that

offers *such temptations* to seduce their minds from the path of duty, and to make their example so powerfully oppose their precepts, is a question more fit to be answered by the doctors of the Sorbonne, than by a plain simple layman, who thinks that an exact coincidence of example with precept is the most effectual course that can be pursued by a divine for promoting the cause of religion among all ranks of men.

That Mr. H. can see the justneſs of this mode of reasoning as well as other men, *when it does not respect the clergy*, is clear from the following paſsage: "I mean not, he says (page 41) to impute *peculiar* depravity to the proprietors of land: they are, doubtleſs, like the rest of mankind. *But human nature must be vastly improved, or large bodies of men, as well as individuals, will generally be actuated by self-interest, real or imaginary.*" Nothing can be more just than this observation; but, if so, what was the use of the foregoing observations respecting clerical men? That these men are not an exception to this rule, Mr. H. himself also most fully admits. It has been often aſserted, he says (page 18) "that the clergy are litigious; and, from their superior knowledge of the tythe-laws, when any dispute arises between them and their parishioners about the fairneſs and the legality of their claims, are perpetually upon the watch to detect some impropriety in the farmer's conduct with regard to setting out the tythes, some informality in his notices, or some other *frivolous* circumstance upon which to ground a prosecution; that by these or similar means they so *harass*, *distress*, and *frighten* them, as, in a manner, to *extort* a composition extremely *unreasonable* and *extravagant*.

"That there are some individual clergymen of this

absurd propensity, he says, as well as some individual farmers foolish enough to be thus *duped*, it were vain to deny, &c." And again (page 59) "This power (the power of drawing their tythe in kind), it is readily acknowledged, may sometimes operate *in terrorem* upon the minds of the farmers, lest it should be exerted to their great inconvenience and embarrasment, as well as to the considerable lessening of their profits, and may also extort from them a forced external appearance of respect, concealing in their hearts a rancorous hatred and malignant aversion." If these things are so, how can any one who sees this, seriously believe that *tythes, however taken, have never been, nor are ever likely to be, any obstruction to agriculture?* Or how is it possible to prevent the great body of the people, who see and *feel* these embarrasments, from entertaining a dread and a detestation of the persons who are occasionally the instruments of such oppression? Of what avail is it in this case (after admitting that such things are actually done) to be told, as we are, page 11, that "a clergyman cannot avail himself of the opportunity described without rendering himself extremely odious in the eyes of his parishioners," if there be clergymen, as we all know there are, who make light of that circumstance, and laugh at it as a folly which they think it below them to regard? After this need we be surprised to hear (p. 65) of "that complaint often pathetically made by them (the land proprietors), that taking tythes in kind, or the occasional arbitrary exaction of them to their utmost extent, excites such acrimonious contentions, such feuds and animosities between the clergy and their parishioners, as very greatly to obstruct, if not totally to defeat, the moral and religious utility of the

clerical office?" Or need we be surprised to find, as we are told by our author (page 70) that "many a clergyman has left his house to avoid the rancorous malignity of his parishioners, excited by *tythe disputes?*" For all this is occasioned by the *temptation* to which the clergy are subjected by the tythe laws, which our author has set himself so strenuously to defend. Never, I think, was there collected together such a series of illustrations so directly calculated to frustrate the end proposed by the writer who detailed them.

After having drawn the clerical character above in such amiable colours, on account of their *moderation* in respect to tythes, and that *conciliatory* disposition which is at all times inclined to wave their rights in order to promote harmony and peace; and, after having stigmatised the individuals among the clergy, who, departing from the mild conduct of Christian pastors, become the terror of the parish and the oppreſsors of their flocks, it was scarcely to be expected that the same person should become the avowed defender of the last named description of men in the fullest exercise of their most despotic powers; because, if the first were praiseworthy on account of the mild exercise of that power for which he has claimed so much credit for them, the last must be blameable for the abuse of that power from which originated evils of the serious nature above stated. How then is it poſsible to reconcile a defence of the last with a principle of rectitude? Yet so it is, that the same man enters with equal alacrity into a defence of the last, as a panegyric on the first, of which the following specimens will afford abundant illustrations.

Repelling a severe remark by Mr. Arthur Young on

the greedineſs, as he says, of the English clergy in regard to tythe, Mr. H. adds (page 77) "That there are some individuals (among the English clergy) careful to demand, and to enforce their legal dues, cannot be doubted. God forbid there should not! When in their power, every tie of nature, every moral obligation, requires it at their hand." If so, I ask whether those among the clergy who neglect to do this, and thus break through "every tie of nature, every moral obligation," are entitled to that praise which he claims for them? They must be certainly wrong, or the others cannot be right. Why, then, does he hold up the *last* in so many other parts of his work as the destroyers of the clerical influence, and here give them such unbounded praise, as the only adherents to "every moral obligation," for a conduct which, as a clergyman, he must acknowledge, is productive of the most baneful influence!

Again, page 93, in repelling the following objection which is urged against tythe, viz. "The tythe-owner claims from the farmer the tenth part of the produce of all his extraordinary labour in tilling the ground, and of all his extraordinary expence in purchasing manures to lay upon it. The *injustice* of the law which authorises this claim is constantly felt by the farmer, and as constantly operates on his mind in direct opposition to that allegiance which he owes to the laws of his country." At the word, injustice, Mr. H. subjoins in a note, "Mr. T. should have said the *imagined* injustice; for its *reality* he has by no means proved; and the farmer suffers bare *imagination* to operate against that allegiance which he owes to the laws of his country." If nothing that is *legal* can be *unjust*, which may poſsibly be here meant to be inferred, it

is true; but if this definition of justice be rejected, then it has been clearly proved in the preceding pages to be false. If so, the paſsage above can be viewed in no other light than an *insult* superadded to *injustice.*

Again, page 102. Respecting a claim by the parson of the parish of Kensington for the tythe of *pine apples* raised in stoves, Mr. H. adds the following note. "This late rector was the respectable Dr. Waller, archdeacon of Eſsex, who demanded of his parishioners what he conceived to be his *right.* His parishioners refused to comply with his demand. The Doctor *very properly* referred the decision to the laws of his country; those laws decided in his favour; and if his parishioners *were harassed in the court of exchequer,* they had only themselves to thank for it; as they refused to comply with a proposal which, in itself considered, has not been proved unreasonable [say unlawful].* But in fact, upon the blush and face of the matter, the *distressful harassing* was on the other side. A single individual, of no very affluent fortune, is *compelled* [who compelled him?] to encounter the combined force of a large and opulent parish, inflamed with rancorous resentment against him. [What was the cause of this rancorous resentment against him?] But, notwithstanding the apparently unequal contest, the Doctor BRAVELY perseveres, in order finally to establish *the rights of the* CHURCH; though, as I have been told, greatly to the injury of his family; and, though he was so persecuted by the hatred and malevolence of his parishioners, that he was forced to flee from

* The house of peers, it would seem, differed from the lord chancellor; for it has of late been decided by them, that no tythe can be demanded for any plants that are reared under glaſs.

amongst them, that he might reside in peace and tranquillity at a distance." He thus concludes the note, too long for insertion intire. "The Doctor lived not to reap the full advantage of his very *laudable* exertions; but his worthy succeſsor, *and the* CHURCH *in general*, and I think too the community at large [?] are under high obligations to him, *and should hold his memory in grateful respect.*" !!!

It is written, "that offences must come: but wo to that man by whom the offence cometh." How different is the doctrine inculcated in this text from that which is preached by this clergyman in our day!

I might multiply quotations of this sort, which could only tend to show that the writer was involved in a labyrinth of confusion, from which nothing short of a steady adherence to a principle of rectitude can ever extricate him. But as this slight view of it will be sufficient to satisfy the intelligent reader, and as it is not my wish to direct the public attention towards the writer farther than as it may lead to the elucidation of the question under discuſsion, I willingly limit these quotations to as small a number as poſsible.

If the facts above stated do not afford proofs that the minds of those who follow the clerical profeſsion in England are so far biaſsed by the temptations to which they are subjected, on account of tythe being appropriated to them, as to blindfold the understanding, and give rise to prejudices which never otherwise could have existed in their minds, I do not know that we can ever look for proofs of any thing of that nature. If the clergy do not see these prejudices themselves when thus fairly exposed to view, the prejudices must be of a deeper and more inveterate kind than I have hitherto

suspected them to be; for assuredly no one description of men in the kingdom, except themselves, can be at a loss to perceive these truths. And if they disregard, or affect to disregard, truths which all the rest of the world acknowledge to be such, can they be surprised if men in general should not scruple to accuse them of insincerity and prejudice, or suspect that a spirit of *self-interest* is the secret cause of such prejudices? If so, will not the public be disposed to watch their conduct with a jealous eye, and carefully to compare that conduct with the mild and disinterested doctrines of the gospel which it is their duty to inculcate, and the professed business of their lives to enforce? If, under these circumstances, it shall be ever observed, that their practice does not in all respects accord with the purity of those precepts which they must inculcate, can it fail to give rise to prejudices in the minds of their hearers, that tend to lower the character of the pastors, and thus to frustrate, in the most effectual manner that could be devised, the primary intention of that institution of which they were ordained to be the cherishers and conservators?

No man who takes a view of the state of men's minds in this country respecting the clergy, can doubt that these considerations make a deep impression on them in general. The virulence, indeed, with which men speak of the clergy universally, in respect to the drawing of tythes, can leave no doubt that this bias of mind has taken deep root, and will be difficult to eradicate: nor can any one who knows the blessed effects that accrue to society from the influence of the clerical body, when they are respected and beloved by their people, fail deeply to deplore this circumstance, and sincerely to regret that any political arrangement

should ever have been devised that should have a direct tendency to counteract that influence. It is this consideration which has induced me to enter into the minute examination of the influence of tythe upon the community at large with the earnestneſs that must be conspicuous to every reader. Few persons, however, have had the same opportunities that I have had of seeing the difference between the respect with which the lower ranks of the community behold the clergy in those countries where no tythes are known, and where of course there are few temptations to give offence from the collision of opposite interests, and that *aversion* from the clergy which is enough to freeze the serious mind of a serious Christian with horror, that is observed so universally to prevail among the lower ranks in those countries where tythe disputes are perpetually rankling in the mind, that lead to acts of insolence and cruelty in the clergy, and of villany and fraud among the people, which are too often gloried in as virtues on both sides, instead of being detested as vices of the deepest dye. During the first fifty years of my life I lived in Scotland, where the parson of the parish, from this circumstance chiefly, is almost universally looked up to as the father of the people, the preserver of the poor, the adviser of the weak, the instructor of the ignorant, and the consoler of every one who is in distreſs. His conduct in most cases is such as gives a weight to his precepts which they could not otherwise obtain. His pulpit discourses, which for the most part breathe a spirit of piety rather than the burnish of learning, are listened to with a respect bordering upon veneration, not by a few only, but by a full congregation of decent people, who

all participate in a certain degree of that devout seriousneſs which is usually so conspicuous in the pastor. Those who have not seen this can form no idea of the respectability of conduct and regularity of manners of the lower ranks of people when their minds are thus informed and purified from the effects of those turbulent paſsions which so much prevail among the same claſses where they are deprived of similar advantages; but such as have seen the contrast can never enough admire the innumerable benefits that are insured to society by the operation of one simple cause, viz. that of *delivering the clergy from the seductions of temptation.*

I repeat it, that the superior respectability of the clergy of Scotland among the people, which so peculiarly characterises them, is to be chiefly attributed to the circumstance of their being freed from the temptation of ever entering into any contests with their parishioners respecting tythes, or other pecuniary concerns. Their respective salaries are fixed by law, and so accurately defined, and the obligation on the parties who pay it is so clear and precise, as to leave no room for dispute, chicanery, or evasion in any case; nor have farmers, or others in the lower ranks of life, almost in any case, the smallest concern in these payments. The clergyman, then, who has no inducement ever to interfere with them in any thing that affects their interest, finds no difficulty in behaving to his parishioners with that disinterested candour and benevolence which so happily accord with the spirit of that gospel whose doctrines he not leſs illustrates by the precepts he enjoins, than he enforces by the unaffected simplicity of his manners. Aſsuredly, no man who seriously reflects upon these things, and who reflects at

the same time upon the great weight that the pure doctrines of Jesus, when preached by a man whose character is held in that degree of respect, must have upon the minds of a whole people, in purifying their morals and regulating their conduct, but must consider it as a matter of the very first importance to society. Even to a layman, who considers it merely in a political light, it will be viewed as inestimable: but to a clergyman, whose views are extended beyond the grave, and who contemplates the blefsed effects that may result from his ministration when thus aided, compared with what it would have been had these influences been counteracted by other causes, who can estimate the exultation that his mind must feel, should a prospect be opened to him, of having the whole of the clerical order freed from those bars which have hitherto so powerfully obstructed his labours in the vineyard of the Lord Jehovah! That many of the clergy of England at this moment feel such sensations as these, and from these feelings relinquish claims that the law might authorise them to enforce, no person, whose mind is influenced by the candour of a man, can either doubt or deny; and that the income of such good men is thus diminished beyond what it justly ought to be, is certain, and much to be regretted; but that there are others of the clerical order, who, regardlefs of these considerations, set themselves to exact with the most rigorous severity the uttermost farthing that the law hath authorised them to demand, superadding even contumely and insult in the exercise of that power, many of the examples quoted above, and innumerable others that might be added, too plainly show. By similar means there can be no

doubt that such of the clergy as disregard every idea of becoming useful as Christian pastors, thus frustrate the very object of the institution into which they have been admitted, by throwing a slur upon the profession in general, and not only become useless themselves, but counteract the labours of their well-disposed brethren; yet such worthless members of the church, such wolves in sheeps clothing (for so undoubtedly may those be deemed who pervert the morals and irritate the passions of the flock, for the purification of whose morals, and the moderating whose unruly passions, the office they hold was originally instituted), are by such wicked practices enabled to live in affluence and ease, if their consciences be so seared as not to upbraid them for it, while their more worthy brethren are doomed to a state of comparative poverty. What shall we say of an institution, then, that has such a necessary, and unavoidably pernicious tendency, but that it is a diabolical invention peculiarly calculated to counteract the precepts of Christianity, and prove perversive to the morals and destructive to the interests of society. If we had not seen examples before our eyes that could not be controverted, would it have been believed possible that a *Christian divine* should be found, whose understanding had been so far fascinated by the allurements of this temptation, as in the sight of an enlightened nation to attempt to vindicate this institution even in its highest perversions! The heart of man assuredly is deceitful above all things! It was surely intended by the *Most High*, that perfection in this world should never be attained.

There can be no doubt that, from the causes above explained, the most virtuous and truly conscientious part of the clergy in this country sustain a depreciation

in respect to income, and a depreſsion of mind respecting the inefficacy of their pastoral exertions, that is much to be deplored; while those who account their clerical duties as nothing are elevated to affluence. Can an institution which has a tendency to exalt the profligate and depreſs the virtuous be deemed either wise or salutary? Can those who vindicate it be viewed in any other light than as enemies to the welfare, both civil and religious, of the community to which they belong? It may be admitted, perhaps, as an apology, though not an excuse for such persons, that it proceeds from ignorance or from unobserved prejudice, and not from any malevolence of design. I could not suppose any man so wicked as to suspect the last: but if this conduct proceeds from ignorance it is blameable, because it is certainly incumbent upon every one first to inform himself upon a subject before he attempts either to refute or to confirm it: if it proceeds from prejudice, it is doubtleſs the duty of all men, but more especially of those of the clerical order, to search the heart with care, and to cherish every embryo of candour that it can there find, in order to eradicate that prejudice wherever the seeds of it can be perceived. Whether this be done by the bulk of the clerical order, when the subject of tythes comes under consideration, there is some reason to doubt. Otherwise it is scarcely to be supposed that, in a case where prejudice may be so naturally expected as here, they would show such a decided reluctance, as is apparent among them as a body, to a full elucidation of a question which is avowedly so nearly connected with the influence of religion; far leſs would a body of men, who must be versant with the principles of sound logic, listen with favour to arguments that are plainly

sophistical and frivolous. I, who have the interests of religion and the welfare of society sincerely at heart, can clearly perceive this; and assuredly they, who either are or ought to be actuated by the same principles, might see the same, were they at the same pains to detect them. They must surely be aware, that a prejudice of this sort, if made palpably manifest, can have no good tendency upon the public mind.

Having in the foregoing pages abundantly proved, as I conceive, that the drawing of tythe in kind has an undeniable tendency to diminish the produce of the country to a great degree, and thus to throw the community into a state of political disorder of the most dangerous nature, and having, I hope with undeniable certainty, showed both from reasoning and the testimony of undoubted facts, that it has at the same time the most unavoidable tendency to diminish the influence of the clergy, and to induce a neglect of religious duties, and a relaxation of the moral principle among the lower classes of the people, I should have entertained a hope, that of all the classes of the community the clergy would have been the most zealous to discover, and the most eager to embrace, any other mode of providing an equivalent provision for the members of the church that was not liable to the same objections as tythe, had not former experience, and the general tenor of the pamphlet before me, given too clear indications that the time for this event is not yet arrived. That a commutation of tythe could be suggested by which the income of the clergy in general would be *greatly augmented,* and that should be liable to none of those powerful objections to tythe whether civil or religious, I have no hesitation to declare to be unequivocally my opinion. Nor should I hesitate to

bring forward a plan for that purpose, and to answer fairly and unequivocally every argument of weight that could be urged against it, did I see the smallest probability that the clergy as a body would enter into the discuſsion with candour, and lend it their cordial support, should it be found answerable to the description above given. This commutation I would propose, not from an inconsiderate desire of innovation, for few persons are more sensible than I am of the danger of rashly making unneceſsary changes, but from a firm conviction, grounded on arguments deduced from a chain of undeniable facts that would require a much larger discuſsion fully to develope than I could find room to give it here, that unleſs something of this kind shall be deliberately done by the legislature, with the concurrence of sensible men of all ranks in the community at large, the nation must suffer ere long a degree of depreſsion which will by no means admit of alleviation; or it may lead to popular convulsions (which, may God Almighty avert!) the end of which no man can divine.

I am glad, before I close this discuſsion, to be able to make one approving quotation, at least, from the pamphlet that has given rise to so many animadversions. On this subject Mr. H. justly observes (p. 61) "The most powerful cause of *moral* and *religious* influence in a clergyman, is the affection of his parishioners;" and adds, "of this affection, as far as I have yet been able to discover, we *at present possess so very little*, that a commutation of our tythes could not poſsibly diminish it; on the contrary, it would give a fair chance for its increase, as it would remove all competition of personal interest, and render us more independent." And again, page 68, "For would it

[a commutation] not remove one principal ground of misunderstanding and animosity between the incumbent and his parishioners, enlarge his prospect of living amongst them in friendship and harmony, and, of course, of being more useful to their moral and spiritual concerns?" In these sentiments I am happy to be able most cordially to concur with the writer. Let me, then, beseech the clerical order in general, as they regard the temporal welfare of that community of which they are members, and in whose downfal or prosperity their descendants must unavoidably participate; as they value their own personal interests; as they prize that respectability which can alone give weight to the clerical character as teachers of religion, and the pure morality of the gospels; let me adjure them as they value the salvation of souls entrusted to their care; and as they shall answer at the great day of retribution, when they shall be required to give an account of the use they have made of the talents that had been lent to them; to be upon their guard against that *(esprit du corps)* clerical guild spirit, which has such a powerful tendency to blindfold the understanding and mislead the judgment, and that has been but too clearly proved to operate strongly in regard to the question now under discuſsion: let me earnestly entreat them seriously to try their heart in order to purify it from that "leaven of corruption" which hath been so long suffered to lurk there unobserved; to struggle against "the sin that doth most easily beset them," and then with one accord to join with the worthy and oppreſsed brethren among themselves who now inly deplore those evils which I so seriously lament, and uniting with a pure heart their efforts with those of other well-disposed and well-informed members of the

community, seriously and in good earnest try to discover in what way an evil of such long standing and such immense magnitude may be removed, without giving rise at the same time to other evils that might tend to counteract these salutary influences. I think there can be no doubt that, when the sensible part of the nation shall be brought thus cordially to concur in their efforts for this purpose, without being under the influence of any sinister views, the object would be found to be attainable. But if clerical men, instead of endeavouring to eradicate, shall try to fortify themselves in their prejudices; if, with this view, they shall prostitute their talents to pervert the truth, under the pretext of elucidating it; if the higher orders among them, instead of giving a check to such pernicious exertions among the inferior clafs of divines, shall, by approving of such publications, and countenancing their authors, encourage them, it is more easy to see to what such a conduct must lead, than pleasing to contemplate it. I shall not enter into the detail: I have performed my part, and here I leave it.

February 16, 1802. JAMES ANDERSON.

ON THE NATURAL HISTORY OF FISHES.

[*Continued from page* 436, *and concluded.*]

On the Migrations and other peculiarities of the Herring.

THE above stated facts, and all others known respecting herrings, tend not to give the smallest indication of any large and regular progrefs of the whole body in any one direction whatever at regular periods of the year. We find them at the same season of the year at Dronthein and the Isle of Man, at Caithnefs and the Isle of Wight, at Stockholm and at London.

This might naturally lead us to suspect, that the herrings, when they retired from our view, went to much shorter distances than has been supposed; and that those which appear occasionally on different coasts are not in fact the same body of fish, but distinct and separate schoales that have no neceſsary connexion with each other, but may retain their station nearly throughout the whole year. Haddocks, we know, are caught upon many coasts; yet no one ever took it into his head to believe that the haddocks which are caught on the Norfolk coast are the same body of fish, or ever intermixed with those that are caught on the shores of Aberdeen. Why then should we suppose that the herrings on the Norfolk coast are the identical fish that are seen in Shetland?

That haddocks as well as herrings do sometimes, from causes unknown to us, leave their usual haunt, and retire we know not whither, is made evident by the following fact, which is in the recollection of thousands of persons who may read this. About ten or twelve years ago, haddocks disappeared all along the south east coasts of Scotland, insomuch that one fish of this sort could not be there caught where hundreds used to be taken. This scarcity continued there for the space of six or seven years nearly, when that kind of fish again unexpectedly returned to those shores in as great abundance as formerly; and, what is not a little remarkable, it was observed that those which did return were of a much larger size than those that went away. Whither these haddocks retired during the time they were absent, no one knows. It only seems probable that they had merely withdrawn themselves from the coast till they were beyond the reach of the fishermen; for had they gone to another part of the

coast it must have been observed by the increased numbers there, which was in no case perceptible.

It seems to me extremely probable, that herrings as well as haddocks do not in general depart far from their native place, and that they never, at any season of the year, abandon entirely any of those seas on the shores of which they have been usually discovered in great quantities; but that, impelled by some instinct or natural want, they at certain seasons approach the shore, or rise near to the surface of the water, so as to come within the reach of man, from whence they occasionally withdraw themselves into deep water, where they lie concealed from us. Upon this supposition all the facts above stated, and every other fact respecting the herring that has come to my knowledge, perfectly harmonise.

We have it in our power to adduce some facts in support of this hypothesis even stronger than any of those already mentioned. There are many and strong indications that there are different *breeds* of herrings, as well as of cattle, sheep, and other domestic animals, which may be distinguished from each other by characteristical marks plainly perceptible; and which, from the strong gregarious nature of this fish, can be traced distinctly for a greater length of time, and through a greater variety of circumstances, than perhaps any other kind of fish whatever.

The first hint of any thing of this sort I ever met with was among the practical fishermen, who had in no sort generalised their notions on this subject, but who spoke as decisively of the Loch-fine or Isle of Man herrings, and others, and seemed to have as clear an idea of the distinctions between them as a grazier in England would speak of the Leicester, Lincoln-

shire, and South-down sheep. From these persons, however, I could draw no decisive information, for their descriptions were so vague that they conveyed no precise idea; and my mind had not yet got into the track to enable me to make any clear arrangements. It was not till I fell in with Mr. Macdonell of Barrasdale, a man of strong understanding, whose employment [bailiff of the herring fisheries, a kind of local superintendant to preserve order among the fishermen on the coasts of Scotland] obliged him to attend particularly to the herring fishery, and the circumstances affecting it throughout his whole life. It is to him that I am indebted for the facts that enabled me at last to perceive a ray of light that gave some indications that the impenetrable gloom in which this subject has been hitherto enveloped may be at last dissipated.

Mr. Macdonell discriminated the different breeds of herrings that were in his own neighbourhood with much greater accuracy than any of the others I had conversed with, insomuch that he could not only point them out at once when showed to him, but could even mention their distinctive marks, which he gave me in writing to the following effect. "The herrings of this loch (loch-urn) and Loch-duich [in its vicinity to the northward] I mean the home-bred ones, are short, their bellies prominent, their backs thick and rather hollow, or bending inwards about the middle of it, than straight; and, as the herrings of both bays seem to be the same, when they leave Loch-duich [during the season they frequent the shores] they generally cast up here. Those of Loch-nevish [to the southward] have more of the salmon shape, are stronger, and have large black and full eyes. Those

of Loch-na-nuach [farther southward still] have something that distinguish them from both." How often do we find that a skilful eye can mark a perceptible difference where no words can be invented to convey an idea of it? The jeweller can thus distinguish a false from a true brilliant, where another person could recognise no difference: nor could he give any idea to another how this can be done.

Mr. Macdonell, taking it for granted that the schoale of fish which frequented the same haunts for years together had been bred there, always denominates them home-bred fish, when he wants to distinguish them from any foreign schoale of herrings that may accidentally intermix with them, which frequently is the case, and which is to be expected; for no boundaries can be there fixed to confine them. "Sometimes, he observes, these foreign fish come into the bay that does not belong to them, and the native herrings themselves sometimes make a turn elsewhere, but usually return again;" though there are no doubt occasions in which they may go so far as to lose their path, and never return any more; these wanderers taking up their residence at last in some suitable situation, where perhaps no herrings before were known, which they make their home, and leave it not for years, perhaps for ages. What follows is a slight sketch of some progreſsions of this sort that had been remarked by the same gentleman. He thus proceeds:

"About eleven years ago [this was written anno 1784] says he, a very large schoale of foreign fish appeared at Gare-loch [east from the north point of the Isle of Skye] about the beginning of August. Their course was from the north southward, and in

their progress filled all the lochs (bays) as far southward as Loch-duich [about 40 miles]. A small branch of it came into this loch [loch-urn, about 8 miles more] continued in it five days, and then disappeared, carrying with them a small body of home-bred fish they found in the loch. They continued, however, longer in the bays to the northward, then retired to the offing, when they returned to these bays; I mean, to the northern ones, and to those on the north and east of Skye, where they remained until the beginning of January. In this way they continued to make their appearance, early and late, for five years, or until the whole body of them were perhaps destroyed; *nor did I hear, nor do I think that this schoale ever removed farther to the* southward or westward. It is remarkable, *that the home-bred fish were all along distinguishable from them.* Since that time no considerable schoale of *foreign* fish appeared in my district; though now and then a few, probably the remains of the great schoale, were distinguishable among the home-bred fish.

"In the year 1753, he proceeds, a very large schoale of foreign fish came into Loch-broom, and the bays in its neighbourhood, in winter. They continued their visits for three or four years; then slackened. Soon after they appeared in Barra, in winter likewise. They continued a year or two, and then made off. The winter following they came into the bays on the west side of Skye in immense quantities, and continued to return regularly every October or November till the year 1765, and afterwards in smaller bodies till 1768, when they entirely vanished."

From these facts combined I can see no reason to doubt that, instead of the whole mass of herrings that

are any where found in our seas being one individual schoale, which, being all bred in one place, and proceeding in a regular course, only separate for a time as circumstances direct, and afterwards unite at one season, that they may set out anew in their annual circuit, and therefore must, of course, be all of one individual kind, they are in reality a variety of kinds of fish of the same species, which have been originally bred in different parts of the sea; and, being of a nature strongly gregarious, they continue to frequent nearly the same original haunts to which they have from their infancy been habituated, and only accidentally at times intermingle with other sorts: that, although they choose in general to abide near their native shores, yet they are impelled by some natural propensity, of the cause of which we are ignorant, to make occasional transitions from place to place: that in regard to these transitions, though they are confined to no particular season of the year if the herrings in general be considered, yet if the particular breeds or schoales only be adverted to, a certain sort of regularity is observable in this respect, so that they return to the same place nearly at the same season one year as at another; and that when any great body of them have once fixed on a station, they usually continue to frequent it for a great many years. It often happens, however, that, after having continued for a great length of time to frequent one station, they sometimes abandon it entirely even for ages together, without being seen there at all; but whither they retire when they make their short disappearance, or where they go when they withdraw entirely from a particular station, is not known, but remains for future investigation. That the particulars above stated accord better with well

known facts respecting the herring fishery than any other hypothesis that has ever been offered to the public, will, I think, be easy to prove: and, if it be so, certain practical corollaries may be deduced from it that may be of considerable utility in the prosecution of that fishery in future, so that it well deserves to be particularly investigated.

Enough has been already said to invalidate the notion of the great annual migration of herrings, and of their retiring to the polar regions in winter to breed. That they do, in fact, breed in all the seas in which they have ever been found, admits of the most decisive evidence; for there is scarcely a take of herrings any where in which there are not to be found individual fishes in all their stages of gestation; some in full roe, some lately delivered only, or *shotten* as they are called, and others having a roe only beginning to be formed. This is so evidently the case, that the Dutch, who have bestowed more attention on the herring fishery than any other nation, and attained to the greatest perfection yet known in curing that kind of fish, have considered it as an object worthy of legislative regulation. Accordingly we find, that in all their placaerts for this purpose it is expreſsly ordained, that all the herrings caught shall be carefully examined and separated into three sorts, viz. the prime herrings, those of an inferior quality, and the *shotten* herrings (which are the worst, and cannot be offered for sale without a mark to distinguish them as such): nor can there be a doubt that the superior excellence of the Dutch herrings is in a great measure to be attributed to this sorting, which is neglected by other nations. Every fisherman where herrings are caught recognises, it is true, the same distinction, and readily admits the fact, that

shotten herrings are to be found every where, and at every season of the year, wherever herrings are caught, though they are also aware that there are at some times a much greater proportion of them in this state than at others. It is, therefore, an undeniable fact, that herrings are bred in all the seas in which this fish is to be found, and at every season of the year.

It is, however, at the same time admitted (as has been just stated) that a much greater proportion of them are in that state at one particular season in certain districts than at other seasons. At some times nine out of ten nearly will be found in this state, and sometimes not one in a score; and, which deserves to be particularly remarked, this does not occur always at the same time of the year. Sometimes a body of herrings will be found, alike at an early or late season, which are almost entirely in this debilitated state; while at the very same time another body of herrings will be found at no great distance from them, that have very few shotten among them: but, if the same body of fish have continued in one haunt very long, it may be observed, that in regard to these fish, a much greater number of them may be found to be in that state (shotten) generally at one season than at others. For instance, I have been assured, by a person who has paid a good deal of attention to the herring fishery on the coast of Hampshire, that before the end of October few shotten herrings are taken there; but if the fishing continue after that season, many more are found in that state, on which account the fishing there is then usually discontinued; whereas, on the coast of Sweden, in the Frith of Forth of late years, on the coast of Caithness, and in many other of the lochs on

the west coasts of Scotland and Ireland, the fisheries are usually only beginning in November or December, and continue through the months of January and February. Nay, it sometimes happens, that in these lochs, a body of fish which are most of them in a lean foul state (shotten) will desert it, and be succeeded by another schoale, which is in the most perfectly sound state. This affords, to me, a most decisive proof that there are distinct and separate breeds of herrings, as there are of any other animals.

That the herring, however, has a natural propensity to withdraw itself from the shores, or to retire from the surface of the water towards the bottom, about the time of spawning, seems to me probable from the circumstance of its being found by experience, that the greatest proportion of the fish that are caught in our seas are in their sound state, unleſs it be perhaps in some particular cases where they are forcibly detained longer than they might be naturally inclined to remain; such as on the coast of Sweden, where it is the custom to surround a whole body of fish with a very long net, having the two ends of the net joined to the shore, and then taking them out with smaller nets within this kind of inclosure. In such situations they may be forcibly retained a long while, so that many of them may be caught in that state. What the fact is with regard to this particular in Sweden, I have had no opportunity of being informed.

That herrings continue all the winter in the sea near those coasts where they are usually caught, is rendered probable from the experience of the fishermen at Drontheim in Norway, who can catch them, and actually do catch them as bait, at all seasons; and by the fishermen in Loch-fine in Scotland, who in-

variably aſsert that they are in that sea at all times, though they are too deep at certain seasons to be within reach of their nets; and, as it is well known, that the herring never takes any bait, they never can be caught by lines. But the fishermen in Loch-ſine positively aſsert, that their lines for catching other fish are often covered with the spawn of the herrings. A probable way of discovering whether the herrings do actually continue in our seas might be, to examine the stomachs of the larger fish that are caught, such as cod, ling, hake, &c. though this cannot afford a *certain* criterion, as these kinds of fish are well known only to frequent shallow banks in the sea; whereas the herrings, when they are about to breed, may seek the deepest waters only for the purpose of depositing their spawn, or for other reasons. Cod are found on banks from 10 to 40 fathoms deep; ling from 20 to 200 fathoms; but seldom are they looked for at these great depths. If future observations shall prove it to be a truth, that the herring naturally retires to deep water to deposit its spawn, and only approaches the surface, or draws near to the shores, when the greatest part of the schoale are in their soundest state of health, we shall indeed have reason to admire the bounty of providence, which hath implanted that propensity, which brings this little fish so opportunely within the reach of human power; nor will the remark of Guicciardini on this subject appear to be extravagant: "Ma par' veramente," says he, "che questi pesci, per pascer' l'huomo dalla natura sieno mandati: perche se ne vengono propinqui al litto del mare, a presentarsi, et principalmente corrono a musare, dove elle veggono fuoco, o lume, o creature humane, quasi di-

cendo pigliami, pigliami." That is: "But it would indeed seem, that this fish had been ordained by nature as food for man; because it comes near to the shore to recreate itself wherever it sees fire, or light, or human beings; saying, as it were, 'Take me, take me.' If it be considered, that this fish lives chiefly if not wholly on the element of water, and thus furnishes food to innumerable other fishes, which minister so abundantly to human nourishment, and which require food of a substantial nature, it will not then be denied that the herring has been destined to perform a very important part in the economy of the universe: and may not the law of nature, by which it is induced to retire to great depths to deposit its spawn (if it be really so) where the young fry, by being beyond the depth that suits its most voracious devourers, may live in comparative safety till they have attained the age that makes them feel the impulse which induces them to rise to the surface, be a principal cause of the immensity of those multitudes which then fill the seas near their native haunts, and furnish such an abundant repast for myriads of creatures who are then continually in pursuit of them! Among these enemies, the whale is the most conspicuous, and the cod fish, perhaps, the most numerous; nor do I think it unreasonable to suppose, that where these voracious creatures are found in great numbers, some variety of the herring tribe may be looked for: but enough has been said on this branch of the subject. These hints are merely suggested as subjects for future investigation.

The locality of the herring, if this phrase shall be admitted, may be also considered as a collateral proof that the different schoales which appear at different stations with great regularity for many years together,

are each of them a distinct body of fish, that have no regular communication or connexion with each other, and therefore may be distinct varieties of fish that have peculiarities which, if carefully investigated, might serve to discriminate them from each other. We know, from the evidence of undoubted historical records, that many centuries ago herrings were caught every year in great abundance in the Baltic; and that for a long period of time this was deemed one of the best stations for the herring fisheries. It can scarcely be supposed, that at that period these herrings went regularly to the northern ocean at one season of the year, from whence they invariably returned to the Baltic; for more than two hundred years not a single herring has been caught in that sea. Is it not, therefore, very probable, that this body of herrings, which had for so many years remained at all seasons in that narrow sea, having by some accidental cause found their way out of the strait, had gone somewhere else; never having been able to find their way back again? In like manner we know, that of late years immense quantities of herrings have been caught on the Swedish coast near Gothenburg, where no fish of that sort were ever seen in ancient times. How long they will continue on that station, the records of future times must show. Thus also it is known, that Loch-broom was the most distinguished station for the herring fishery on the west coasts of Scotland, and continued so for many years, though of late it has been scarcely distinguishable from other stations on that coast. The Yarmouth herring fishery has continued for a great period of years, as also those near the Isle of Man, and in Loch-fine; though at no period, so far as I can learn, were these fishings ever so abundant as

some others. While the herrings have continued to be caught in these places for a great number of years with a comparative degree of steadineſs, the herring fisheries on other parts of the coasts have been subjected to great variations. A very considerable herring fishery was carried on with great steadineſs, about the month of August annually, for the space of fifty years or more, before and after the year 1700, on the south east coast of Fife, where scarcely a single fish of that sort has been seen for upwards of fifty years past; and it has been already remarked, that for about ten years past an abundant herring fishery has been carried on every year from the month of November to February or March, in the Frith of Forth, higher up than Edinburgh, where no herrings were ever known to have been seen before that time. I might enumerate many other facts of the same kind, but this would only prove tiresome; these, I hope, will be deemed enough to show that it is highly probable, that each particular schoale, or great body of herrings that are discoverable any where, is a distinct breed of fish that has peculiar qualities and habits which distinguish it from others: that among these peculiarities a disposition to retain the same station, and make its appearance at a particular season of the year, is one of the most distinguishable; and that when these peculiarities are once ascertained, a recurrence of the same phenomena may be looked for with some degree of certainty for several years; but that no absolute dependance can ever be had on its continuing for any fixed period of time, far leſs that they will never abandon those haunts in which they have long delighted. Influenced by these considerations, I ventured to advise the fishermen on the Frith of Forth, when the herrings first so unex-

pectedly made their appearance there in a large body, and when these fishermen were in great doubt whether they should make any preparations for their return the ensuing season, by all means to avail themselves of the opportunity that their departure afforded, to make preparations for their return; as the probability was very great that they would return not only the next year, but for many succeeding years with much regularity about the same season of the year. The fact has since proved that my reasoning was right, and they have been benefited by the advice. No man, therefore, ought to look upon disquisitions of this sort as idle speculations: were they more carefully investigated than they have been, they might lead to very useful conclusions.

I hope this will be admitted as a sufficient apology for my adding one farther hint on this subject before I leave it, and which I suggest merely with a view to stimulate to more accurate investigation; it is this. Since it seems probable, that different schoales of herrings are distinct breeds which propagate their kind with a certain degree of regularity, as breeds of other animals do, is it not reasonable to suppose, that distinct breeds may poſseſs peculiar qualities which may render them more valuable than others, or the reverse, for particular purposes? And, if so, may not this peculiarity be the cause of certain distinctions in the marketable qualities of this fish that may have been attributed to other causes? I have often eaten herrings that were caught upon the coast of Wales, and have been at all times satisfied when I ate them that they had a flavour very different from those which I have eaten in Scotland; and in Scotland, the Loch-fine herrings have been in general reckoned far superior to

those taken on the east coast. Nor are herrings peculiar to the European seas; they are, or might be, also caught in great abundance at certain seasons of the year on all the northern shores of the American states; but these herrings are so much inferior in quality to those in Europe, that no one ever attempts to catch them as food for man. This shows that they must be at least a distinct *variety*. I regret, however, that I have not been able to learn whether they constitute a distinct *species*.

One other singularity respecting the natural-history of the herring, that is connected with its migrations, deserves to be here noticed, as it is a circumstance that, so far as I know, has not a parallel. On account of this singularity however, though I deem it deserving of notice, it is proper I should at the same time specify that I do not mention it on my own proper authority, for I never saw it; but upon the *invariable* report of all the persons that I ever conversed with, who have lived on the coasts which herrings frequent, as well as those who have prosecuted the herring fishery as a business; who unanimously agree in asserting it as an undeniable fact, that when the herrings, after appearing in any arm of the sea in great numbers, and remaining there for some time, are about to leave it, as a preliminary to their departure a signal is given, which the people who speak of it denominate *the cracking of the herrings*. By this phrase they mean to denote, that a loud sound is heard, resembling the crack of a pistol when it is fired off, which generally takes place in the evening; and it is invariably the case, they say, that after such sound has been heard, the herrings will wholly disappear from that place before the next morning.

Such is the unvarying report of those people; nor did I find one, even among the higher classes, who did not concur in, and firmly believe it; yet I am by no means satisfied that this opinion may not originate in some accidental unobserved circumstance, which would appear nothing extraordinary if clearly explained. No one pretends to conjecture in what way this sound can be produced. That opinions, which were as generally adopted in former times as this is, once prevailed respecting the herring, which are now proved to be erroneous, is clearly demonstrable. Among the vulgar, who have only *heard* of herrings, it is a very prevailing notion to this day, that the herrings have a king; and this opinion must have been once entertained even among well-informed people in the days of Guicciardini, otherwise that well-informed author could not have adopted it. The following is a literal translation of what he says on this subject. "They have among them, without any doubt, some kings, in the same manner as the bees have; only these are of the same size and form with the other herrings, and not larger, as is the case with the king of the bees [the sex was not then discovered]; but they have, in truth, a mark on the head which appears like a crown, and they are of a reddish colour, especially the head. This king, going before, is followed by the whole body; and because they have shining eyes like fire, they appear at night like lightning, which is vulgarly called the lightning of the sea." This idea has long been entirely exploded, and the flashes of the sea are well known to owe their origin to another cause.

As herrings eat no known solid food, they are never to be taken by means of bait of any kind. The usual mode of fishing for them is with nets, which are not

hauled on shore like those for catching salmon and many other sorts of fish; these nets are merely suspended in the water in a perpendicular position by means of leaden weights fastened to one of the edges by way of sinkers, and buoys on the other edge to keep it afloat. These nets being let down among the body of the herrings, individual fish are intangled in the meshes as they attempt to pafs through them, and thus are hauled into the boats in immense quantities. In consequence of this mode of fishing having been long pursued, several peculiarities respecting this interesting creature have been brought to light that deserve to be specified.

In the first place, as it never has been observed, that the nets catch more in general when they are placed in one direction than another, fishermen observe no sort of regularity in this respect, but lay their nets indifferently in whatever direction accident may suggest. This affords a strong corroborative evidence, that the supposed regular progrefs of the herrings from north to south is merely hypothetical; for, had the theory been just, more must have invariably been caught when the nets were stretched from east to west, and thus placed directly to thwart their progrefs, than when placed from north to south, which, by being parallel to their route, could have interrupted few or none.

Secondly, it has been thus ascertained, that at times the whole body of the fish are nearly of one size, so that they can be caught only by nets of one size of mesh; insomuch that one boat, which has nets of the proper size, will catch vast abundance of fish, while another boat along-side of it, with nets of a different size of mesh, shall not be able to catch a single herring. At other times, however, the fishing will be

nearly equally abundant with nets of a large, of a small, or of a middle sized mesh; which indicates, that they are sometimes of one sort only, and at other times of various sorts or sizes intermixed.

Thirdly, it has been thus also ascertained, that the herring not only keep together in a compact body, whose limits, when viewed horizontally, are pretty distinctly defined, in as far as respects their progress towards any point of the compass, but that the limits of this body are equally defined in respect to the depth at which they swim. At some times the upper parts of the nets must be kept nearly level with the surface of the water, or few will be taken; at other times the buoy ropes must be lengthened to several fathoms, or no fish will be caught. In the first case, the whole body of the fish rise near to the surface of the water; in the last, they as carefully avoid it; but keep nevertheless nearly at the same depth for a time. This renders it extremely probable, that they may sometimes choose to take their station so deep as to be wholly beyond the reach of human power, though still in the same seas, where they might be caught in great abundance could we reach them. It is only when they are near the surface that they can be discovered by gannets and other sea fowl, who then hover over them, and, by darting from a great height, dive among them, and catch many, exhibiting a singular spectacle to those who behold it for the first time. It is then alone also, as I suspect, that they are followed by whales, who prey upon them as a favourite food.

When they rise quite near the surface of the water, these little fish exhibit a phenomenon at times that is very amusing, and that is among the vulgar called the play of the herring. This is most frequently ob-

served towards the evening, when the weather is warm and still. It produces, to one who listens, a sound that bears a near resemblance to the patter made by large drops of rain falling on water; nor does it much differ from this appearance when looked at. It seems to me that the herring rises then to the surface, which it just penetrates with its nose, or some other part of its body, but never rises so far as to be seen. It bears no sort of resemblance to the leaping of other fishes after flies or other insects, unleſs it be that of a sly old trout, which sometimes merely dimples the surface, but is afraid to venture farther. This kind of play I have often witneſsed myself.

My limits preventing me from proceeding farther in this investigation of the nature and habitudes of fishes, I must here conclude this disquisition; but not before I have mentioned an ingenious contrivance adopted by a very worthy man, Mr. Arbuthnot at Peterhead, North Britain, which promises to afford facilities in regard to the study of this branch of natural-history that it never hitherto has enjoyed. This gentleman has contrived to excavate many large basons out of the solid granite rock in the neighbourhood of Peterhead. These basons he can fill at pleasure with salt water at high tide time, and empty at low water. Several of these large reservoirs he appropriates for the purpose of sea bathing, which offer facilities and elegances in this respect that have been hitherto deemed unattainable. Into the other reservoirs he means to put sea fishes of various sorts alive, when recently taken by the fishermen, of which great abundance can be there caught; and there he purposes to preserve and feed them occasionally for the London market. As

the water is clear and still in these reservoirs, the fishes can be seen with great ease in all their movements and practices; and there, of course, the naturalist may prosecute his observations with pleasure. The undertaking is as yet in its infancy, so that no time has been allowed to ascertain facts with accuracy. One fact only that has been thus ascertained has come to my knowledge; which is, the remarkable docility and quickness of comprehension of the common haddock when compared with others. This little fish is so acute in its perceptions as to be tamed almost in an instant; so that, if it be fed, it begins to know its benefactor in a day or two, flies towards him the moment he appears, and follows him as far as the element that it inhabits will permit wherever he goes, nearly after the manner of a dog. The remarkable voracity of the cod fish is here also proved in the most decisive manner; and many other curious facts may thus be ascertained; on which account I beg leave to recommend this invention to the notice of the curious.

To the Editor of Recreations in Agriculture, &c.

SIR,

As I have read your Recreations from the beginning, I had imbibed a strong prejudice in favour of Mr. Forsyth's plaster, and his management of fruit-trees in general; and being a lover of gardening, though I have had it less in my power to attend to it practically than I could wish, I lately purchased a small treatise on the culture of the apple and pear-tree, by T. A. Knight, Esq. which I read with much pleasure; though I could not help being staggered at one passage, because it tended to place Mr. Forsyth's practice in a less respectable light than I had been accustomed to view it. This is contained in a note

on page 16 of the second edition, which I shall transcribe below; and, if it be not imposing a disagreeable task upon you, I shall deem it a particular favour if you will state what occurs to you respecting the matter of fact which seems to be called in question in that note. I am your constant reader, URBANUS.

The note runs thus:

"The accuracy of my experiments has been questioned (in a very liberal and gentlemanlike manner however) in the Monthly Review, because the result of them did not agree with those of Mr. Forsyth. In consequence of the doubts there expreſsed, and at the desire of Sir John Sinclair, then President of the Board of Agriculture, I went to Kensington to see the trees which had been the subject of Mr. Forsyth's experiments. I was showed some St. Germain pear trees, whose branches had been taken off, and whose stems had been plastered, which had shot forth new branches with great vigour; but this variety of the pear is in its middle age, and free from debility and decay. Some trees of the golden pippin had been subjected to the same management; but in these it did not succeed, and I never saw that tree in a lower state of debility and decay than at Kensington. The object of my pursuit does not call on me to give any farther opinion on the general merits of Mr. Forsyth's composition; but I must say that I do not place much confidence on any topical application to the wounds or diseases of vegetables."

Had my correspondent been acquainted with the liberality of Mr. Forsyth's disposition, he would probably have applied to that gentleman himself rather than to me; who would have readily given him all

the information that he could wish for on the subject of his letter. To afford this gentleman, however, and others who may have taken notice of the paragraph which he has transcribed, all the satisfaction in my power, I made it my business to go to Kensington; and having asked of Mr. Forsyth whether he could with certainty point out to me the same trees that he had showed to Mr. Knight of Herefordshire, who had called there some time ago, particularly the golden pippins, he readily answered that he could; for that he remembered it extremely well. We went together to the spot, and he showed me two apple-trees, which he assured me were the very identical golden pippin trees that were pointed out to Mr. Knight as those that had been managed according to his own mode of treatment. I found them both in as healthy a state as any trees could be wished, and as full of fruit-buds in every part of the tree as could be desired; and any one who wishes to be satisfied of this fact may see them with his own eyes whenever he pleases. Mr. Forsyth added, that he had also showed to Mr. K. some other trees of the golden pippin, which he had left to grow in their natural state without any application of his plaster, and which were indeed as full of canker as perhaps any trees he had ever seen. I was much at a loss to reconcile what I had seen with what occurs in the above extract. Being aware, however, that some circumstance which was omitted in this passage might be explained in some other part of the book, I said nothing more at that time; but having procured the book itself, I took it home and read it through with a proper degree of attention. I found it a very ingenious performance, and written throughout in a gentleman-like manner. The author seems to be fully

convinced himself of the truth of every doctrine that he there inculcates, and is evidently impreſsed with a strong conviction of the importance of adverting to the particulars which he brings under the cognisance of his readers; so that, whatever opinion may be formed by the reader of the hypothesis he has there endeavoured to establish, I think every one will feel an impreſsion of the general integrity of his mind. I could not, therefore, help feeling some anxiety to reconcile the statement which he had made with the fact that I had just seen.

With this view I tried to enter into the state of his perceptions as well as I could; for I am well aware, that when a train of ideas that have never before been noticed get poſseſsion of the mind, it becomes extremely difficult to find words to denote these ideas that have not been employed before in another sense; which may prove a source of ambiguity and mistake, and give rise to perceptions in the mind of the reader totally different from those that were meant to be conveyed by the writer. No writer, therefore, under these circumstances, can be too careful in defining his terms; and I think I can perceive some indications of careleſsneſs in this respect, in the paſsage above quoted, that may make the author *seem* to say what he never intended. I shall explain myself.

That the mind of Mr. K. was, when he wrote his book, under the influence of a powerful prepoſseſsion in favour of a particular hypothesis, no one who reads it can doubt. His notion, if I have been able to conceive it rightly, is, that every tree (fruit-trees in particular) has a certain period of existence aſsigned to it by nature, which, although it may in some cases admit of being retarded or accelerated a little, must still

be proceeding forward in a steady progresion towards decay: that in this progres its wood becomes more spungy, its shoots more stinted, and its fruit les perfect: that the whole tree becomes more liable to canker and more subject to various other diseases: that, in short, no art whatever can restore it to its pristine health or vigour when it has once advanced to that stage of decrepitude. "A tree," he says, page 176, "like an animal, has its infancy," its "flowery spring," its "summer's ardent strength," its "sober autumn fading into age," and its "pale concluding winter:" and "nothing surely can be more unphilosophical than to suppose that a piece of an old dying tree can ever form a healthy and vigorous young one." Such is the hypothesis of our author in its great outline; and when the pasage just quoted is taken in the sense that most readers would understand it, as it here stands, perhaps few would object to its justnes: though, when we come to consider it in the sense in which his explanations must induce us to suppose he used it, we shall perhaps find, that all philosophers have hitherto been so unphilosophical as to adopt the very idea that he here so fastidiously condemns.

By the life of a tree our author does not here mean to confine his view to the duration of the mere individual plant, as the reader will naturally do; but he means, that it should apply to all the plants that have sprung from it; whether these have derived their origin from a graft, a bud, a layer, a cutting, or a seed: all of these, in whatever way they may be propagated, participate, in his opinion, in the degeneracy of the parent tree; and, if I do not mistake his meaning, they degenerate to an equal degree in all the descen-

dants, as the parent tree does, in whatever way the offspring may have been propagated, unleſs perhaps with regard to *seeds*, which, under certain circumstances, he seems to be inclined to think, admit of some small meliorations; but this is indeed so obscurely expreſsed as not to enable me to be certain that I do not here mistake him. If, however, he does admit that some difference may be thus produced, it does not alter the rule; for, at the best, it can only be a small retardation in the deteriorating progreſs, which must inevitably be still going forward. According to this hypothesis, then, it must be decidedly admitted, that all the trees on this globe are in a perpetual progreſs of deterioration: that, of course, neither wood nor fruits of any kind can be now so good as in former ages; and, consequently, a time must come, in which none of those stately plants which have been the solace of men from the beginning of time can be good for any thing.

I am not aware that I carry the inference in this respect farther than the text fairly authorises; and, most aſsuredly, I mean not to do it: at any rate, there can be no doubt that his book inculcates in the most positive terms, that every tree which is propagated by grafting or budding undergoes the same changes respecting the wood, fruit, and diseases, that the parent tree itself undergoes, or would have undergone had it continued to live; and that this progreſs of deterioration is continually and uninterruptedly going forward in them all, and with an equal degree of rapidity. This, I think, is undeniably his hypothesis.

Let us now, bearing in mind these notions, subject the paſsage in question to examination, with a view

to see whether his expreſsions can be made to quadrate with those facts which I have stated above.

In the first place, the reader will now be able to see what is the meaning of the phrase "*but this variety of the pear* (the St. Germain) *is in its middle age, and free from debility and decay*;" which he could not have done before. He will now understand, that the phrase *middle age* does not apply to the age of the individual tree in question, but to the age of the parent stock, and to the progreſs it has made in its course of decay; and that this remark must apply to all the St. Germains pear-trees in the universe, be they young or old, be they healthy or weak, be they diseased or sound.

Keeping these ideas in mind, we may be enabled to perceive, that when Mr. K. says, that "some trees of the golden pippin had been subjected to the same management; but *in these it did not succeed*;" his meaning might not be the same with what those words would convey to an ordinary reader. If he meant to say, that, in consequence of these operations, the deterioration that, according to his opinion, the tree had already sustained in consequence of its age was not removed, which deterioration he might alledge was indicated by weakneſs of shoots, when compared with those of some other kinds of trees, and a dispoſition to become cankery if left to itself, in this sense of the word he might perhaps speak true; for no man who knows the golden pippin, and Mr. Forsyth among that number, will deny, that these are natural habits of the golden pippin, which it poſseſses at this hour, as it has in all probability poſseſsed from the first hour

that it existed. Mr. Forsyth has too much sense to pretend to say, that he ever poſseſsed the power of altering these natural habits of trees; and I believe he would as soon attempt to make a thistle plant produce a pine apple, as to make a golden pippin produce shoots like those of a codling, or bring a Hertfordshire red streak to bear twigs like those of the Mincham crab. Every tree, he knows, has natural habits peculiar to itself, and wood, and shoots, and leaves, and fruit, which identify it, that, under the same circumstances, have continued the same seemingly since they were first known, and will in all probability continue the same to the end of time. This being his firm conviction, he never had an idea of altering these things by any of his operations. All that he pretends to do is, to remove disease at the time; and, wheresoever it breaks out, to make the tree sound, and restore it to its best state of health. His pretensions are precisely of the same kind with those of a man who had discovered a mode of removing the pain of the toothach by a certain and easy application, so that the person who was distracted by it should be made perfectly free from pain, and capable of performing his other animal functions without being in the least disturbed by it, although he did not pretend to say that he had so far altered the system, as that the toothach would never more return; but only that, if it should return, he could then again remove it with ease, so as to preserve the body uninjured by it: or that of a surgeon, who should undertake to heal a wound where it should accidentally occur, without being able to insure the patient against another wound of the same sort at some future period.

Now, if Mr. F. pretends to do no more than to heal

a wound by means of the judicious application of his plaster; to remove a gangrene; to restore a decayed tree (even when it was at the very verge of destruction) to as high a degree of health and vigour as ever any tree of the same sort has been known to poſseſs; to make a fruit-tree which had given over bearing for many years, or which had produced only a few hard and abortive fruits, resume once more as high a degree of prolificacy as any of that sort of tree ever had, and produce as fine fruit as any of the kind has ever been known to bear; if he does these things, not by accident, at particular times, but at all times with certainty when he undertakes it, it will be impoſsible to deny, that when Mr. K. saw this done with the golden pippin trees before his eyes, he has been guilty of misrepresentation, through accident, at least, if not through design, when he says, that "his management did not succeed" on that particular tree, without specifying the particular meaning that he annexed in this sentence to the word *succeed*. That Mr. K. "never saw that fruit (the golden pippin) in a lower state of debility than at Kensington," may be also very true; but he has omitted to tell that this tree was *not* one of those *that had been subjected to Mr. F's management*, but merely a tree preserved for the sole purpose of showing the effect of his mode of management. This may be truth, but it is not *the whole truth, and nothing but the truth*, which all witneſses are bound to declare when seriously examined.

This oversight appears to me the more reprehensible, in that it would seem, from what immediately precedes it, that Mr. K. annexed the same idea to succeſs in Mr. Forsyth's experiments that ordinary readers do; for he seems to admit that his experiment had *suc-*

ceeded on the St. Germain pear, because "it had shot forth new branches with great vigour." For, if we for a moment adopt the idea of Mr. K. the vigour of these shoots of this pear is no greater proof that it has not degenerated from the parent stock, than the leſs luxuriant shoots of the pippin prove that it has degenerated at all; seeing that we are furnished with no data by which we can ascertain the comparative vigour of either of these in respect to the original trees of either sort.

In short, the whole of this hypothesis of Mr. K. hangs upon bare aſsumptions only, without even an attempt at evidence of any sort to support it. He has taken it into his head to believe, that all kinds of fruit trees of old standing have degenerated, and are become dwarfish, weak, and diseased; and he *asserts* it is so; and there it rests. It happens that the golden pippin, which has been long a favourite apple, has shoots rather smaller and weaker than those of some others, and therefore he says it is degenerated through age. What reason (I ask) have we to believe that it ever was otherwise? I know of none; for aſsuredly Mr. K. has adduced no facts in proof of it. The nonpareil is among the most vigorous shooting apples that we know; and the shoots of the codling are still more thick and robust: why have not these dwindled? For I believe they are nearly of equal age with the golden pippin. The wood of these trees is, indeed, in some measure liable to canker, as is that of the New-town pippin also, one of the newest apples that we have. In short, none of these peculiarities, in as far as we have means of knowing, have the smallest connexion with the age of the tree. Every tree has its own habits from its infancy, which it always retains. There

is a particular kind of ruſsetting common in Wiltshire, a good apple and a good bearer, which is not known to be an old tree in Mr. K's. sense of the word, but which is so liable to lose its young twigs in winter, that usually three out of four of them are seen standing dead upon the tree each spring. This Mr. K. might attribute to degeneracy through age, though no man ever saw the tree otherwise.

That Mr. K. might be loath to abandon a favourite hypothesis, is no surprising thing; and no man could be better pleased than myself to smooth the way for his hobby when I saw it was only indulging in innocent gambols. But when it obtrudes itself, and officiously stands in the way of solid and undeniable improvements, there is a neceſsity for turning it off the road a little, in order that it may not do injury to the public. That the fondneſs for this hobby has biaſsed the judgment of this respectable gentleman, the evidence is, I am afraid, too strong to admit of doubt. Not to resume that which has been already said referable to this head, what other cause (I will ask) can be aſsigned for his having entirely confined his remark to the *St. Germain* pear, as if that had been the only one which he saw there in similar circumstances? Did he not see the Colmar, Crasane, D'Auch, Bergamote de Pasque, Chaumontelle, Bon Chretien, Lewisbonne, and almost every other good kind of pear usually cultivated in this country, all treated after the same manner, and each of them (I do not say in as high, but) in a *higher* degree of general health and prolificacy than ever he saw them elsewhere? Did he not also see all the varieties of the best kinds of plums and cherries treated in the same manner, and all of them *more* luxuriant in their shoots, freer from gum and

canker, and in a fuller state of productiveneſs, than ever he saw an equal number of trees of the same sort any where else? If so, what other reason than that which I have given can be aſsigned for his having wholly omitted to mention them? And these things, I think I may take upon me to aſsert, he must have seen; for no person who has been in those gardens for several years past could avoid seeing them, unleſs he voluntarily shut his eyes against them. Of this fact I do not wish that any person should rely on my word as sufficient evidence. Any one who lives near the metropolis may satisfy himself as to it with his own eyes at the present moment if he pleases, by inspecting the trees as they now stand; and it will be easy for them to judge what state they have been in for several years back.

I shall only beg leave to state one fact more respecting this subject. I have it not in my power at present to consult the Monthly Review quoted in the above extract, and therefore I cannot know what was there said; but if it tend to controvert the truth of Mr. K's hypothesis from facts brought to light by Mr. F's practice (as seems to be inferrable from the quotation), I cannot help concurring with that opinion. Mr. K. could not fail to observe both cherry and plum trees in that garden which had been in such a state of decay as to have been all rotted away except about one inch of bark; yet, so far was the vital principle from being extinguished, that under Mr. F's management they have been restored, with a surprising promptitude, to a degree of health, vigour, soundneſs, and prolificacy, that has been scarcely ever seen. And, instead of giving indications of degeneracy, cherry trees that are known to be about eighty

years of age are at this moment flourishing in all the vigour of youth; and, for aught that appears to the contrary, might, by a judicious continuation of the same conduct, be preserved in equal health and vigour for many centuries yet to come, producing wood equally healthy, and fruit equally good, to the latest period of time: and, although no art can ever make the shoots of the Morello cherry equally strong with those of the Duke, are we from thence to conclude that the Morello has acquired that weakneſs of shoots through age? The weeping cherry has shoots yet weaker, though it be among the newest cherries in our gardens. In like manner, though all the trees of the cherry tribe have a natural and invariable tendency to canker and gum, are we to conclude that these are diseases contracted through age; and that they ought therefore to be abandoned as incurable, when we have before our eyes the plainest practical demonstration that, by a little attention, which can be easily bestowed by any intelligent person, these diseases may be so effectually removed (if not prevented) as never to exhibit the smallest degeneracy either respecting the abundance or the fineneſs of the fruit? If these facts are so, and if this be all produced by the judicious application of a simple plaster that can be at all times obtained in abundance at a very trifling expence; if by means of the same application forest trees, when reduced to the extreme of debility, may be restored to perfect health; if holes in trees, which might have rendered of no use whole tons of timber, can by its aid be brought in a few years into such a state of soundneſs that no one can kuow the new from the old wood; if all this, and much more, can be done, as can be demonstrated by the most un-

deniable facts, what can we think of the man who declares that he "does not place much confidence in any topical application to the wounds or diseases of vegetables," unleſs it be, that his hobby carries him on at such a rate as to prevent him from paying attention to the facts which are placed before his eyes? Yet, for all this, I do not wish to discourage the use of hobbies. They are a pleasing sort of animal when they are employed for the mere purpose of recreation; but, whenever they are forced to undertake any serious work, they are the veriest jades that can be conceived, throwing every thing into confusion, and therefore should be carefully discarded from such employment.

Although I thus endeavour to remove that film of prejudice which hath blinded the perceptions of this respectable gentleman to a degree that I am persuaded he is not himself aware of, yet I wish by no means to depreciate his labours, which, in the practical part, where his theory does not interfere, discover attention and discernment that are rarely to be found among writers; and therefore in these respects are highly deserving of the attention and favour of the public; yet I consider the benefits that have been already derived from the practice of which he has been induced to disapprove as being too great, and those to be expected from its general adoption in future ages of such inestimable consequence to the public, that I consider it as a duty to counteract the influence of such prejudice as much as is in my power. I have attended to the progreſs of these operations for several years past with aſsiduous care, and marked the result; the consequence is, a most thorough conviction of what I have just stated to be my opinion, though I was rather sceptical with regard to it at the beginning; nor

am I very much surprised if gentlemen, when they view the tree so treated for the first time, should feel a sort of hesitation at believing in the efficacy of the application to its full extent; for the appearance of the plaster certainly gives no prejudice in favour of the health of the tree. It is only after the plaster has been slowly worn off that the renovated health and wonderful soundnefs that it produces can be rendered perceptible; and it is one of the peculiar excellences of this composition, that it remains long upon the tree without hardening (thus giving way to the growth of the tree), and gradually scales off, not till after the cure has been perfectly effected; this white unsightly plaster often covering a bark as green as an apple and as smooth as a glove, were the whole of it completely washed off.

To the Editor of Recreations in Agriculture, &c.

SIR, March 5, 1802.

As no one is in my opinion so capable as yourself to appreciate the effects which have already arisen, or may eventually arise, from the agricultural exertions of the late duke of Bedford, whose premature death is so generally and justly lamented, I beg leave to suggest to you the propriety of inserting in the next Number of your Recreations a sketch of his character, with your sentiments on his conduct in that respect. I have no doubt that if you comply with this request many of your readers will be much gratified, and at the same time it will be highly useful; because, if it shall be proved that the mode he pursued was productive of good, such proof will be an additional stimulus to those who move in the same elevated situa-

tion to follow his example; and if, on the contrary, it should appear that, although his intentions were good, yet that the objects he contemplated, if attained, or the methods of attaining them were objectionable and pernicious, then it will afford a neceſsary leſson to others to avoid his errors, and to direct their own efforts more beneficially. But whatever difference of opinion there may be as to the measures he pursued, and the ends he had in view, certainly none can deny that his name deserves to be recorded in every work which at all treats of the science of agriculture. How different has been the conduct of this illustrious nobleman to the generality of that claſs of men either in the present or former times. Born the heir to one of the largest fortunes this rich kingdom could boast of; early freed from controul, and with every opportunity to gratify his desires, however irregular and wild; gifted with a person formed in one of nature's finest moulds, and with an understanding inferior but to few, instead of wasting these great advantages in the sinks of debauchery, or of enervating his faculties by unrestrained indulgence, his first efforts were made to deliver his country from the inevitable and often foretold effects of a bloody war and an incapable ministry. When these were found to fail, instead of indulging the repinings of disappointed hope, and waiting in lethargic inactivity until the wheel of fortune should raise him to the topmost height, he turned the force of his great abilities into another channel, and sought, by care, industry, perseverance, and every laudable device, to increase the riches, power, and happineſs of his country, by leading the attention of its inhabitants to the improvement of their indigenous productions; by simplifying the labours of agriculture,

and endeavouring by every means to raise a spirit of emulation amongst the farmers and cultivators, so that all their energies might be employed and concentrated in promoting these objects. You, sir, who have so often had occasion to point out the neceſsity of patience and perseverance in every agricultural pursuit, in order to form any correct and perfect conclusions, will well know how to value these qualities in the noble duke; they are indeed, in every situation of life, inestimable: but it is useleſs in me to occupy more of your time with reflections and arguments so obvious that every one must feel their force and acknowledge their justice. I shall, therefore, conclude this letter with an observation which can never be more truly applied, viz. "that nature might stand up, and say to all the world, *This was a man!*" I am, sir, your most obedient servant, S. H.

The Editor sincerely laments, he believes in common with every well-disposed mind in the kingdom, the untimely fate of the nobleman who is so properly noticed by his correspondent. But he himself had so little personal acquaintance with the duke of Bedford, that he can no farther appreciate his merits than almost every other person in the kingdom; he dare not, therefore, venture to obtrude opinions on the public which some might deem, under these circumstances, unfounded panegyric. His own private sentiments respecting the last, and greatest (in as far as he knows) of the duke of Bedford's public undertakings, the national farm, he had the honour to announce to the public in the 30th Number of this work; and he presumes that, in regard to this particular at least, the public will be unanimous; and unanimity in respect

to an institution which must excite envy in the breasts of many, is doubtleſs in itself a much higher panegyric than any thing that a private individual could suggest. That any undertaking of man should be perfect, and liable to no objection, is not to be expected; or that any human being should be poſseſsed of all the wisdom, of all the knowledge, of all the virtues, and of all the fortitude that the mind of man can conceive, without any of the foibles of human nature, is not to be supposed; but, doubtleſs, among the efforts that become a man of elevated station and great fortune, no one can claim a higher rank than that which tends to promote the prosperity of agriculture; for in that is involved the welfare of millions of persons whose situations in life prevent them from ever bestowing a thought upon the subject themselves. In this point of view, then, the character of this nobleman stands singularly prominent, and ought long to be revered by every well-wisher to the human race. I trust that his exertions in this respect will not be frustrated by his untimely fate; but that his succeſsor will glory in having the honour to participate in perfecting that which his brother had so happily begun.

Nor let the fame that this distinguished peer has thus acquired discourage others from proceeding in the same career; for much, very much remains to be done before the object can be completely effected, and laurels innumerable are in store for such men of rank and fortune as shall seriously enter upon the investigation of this subject; for, after all the physical facts that it concerns the husbandman to know shall have been fully ascertained, they can prove of little avail until the moral obstructions that stand in the way of agriculture shall be removed. This is a walk in which

there is full scope for the most vigorous exertions. The enterprise will be arduous, but to him who shall persevere so as to overcome, the reward will be truly glorious.

Concluding remarks on the management of Clayey Soils.

AGRICOLA, after returning thanks for the directions given in this work respecting the management of clayey soils, says he is still at a loss respecting the following particulars, concerning which he wishes for farther elucidations, viz.

First, respecting the eradication of couch grass from his old corn land. "Some of my present corn fields, he says, are very full of couch, and I am afraid that were I to proceed to improve these fields according to the directions you have given, the roots of this grass would not be killed by being turned to the bottom of the furrow along with the mould in which they grow, but that they would spring up, and spread through the improved mould, and thus frustrate the experiment to a certain degree. I beg to know if this conjecture be well founded; and if so, how should I proceed to obviate it?"

Secondly, "respecting grass fields, as it appears that before these can be meliorated in a proper degree they must be first converted into corn land for some time, I am at a loss to know in what way I had best proceed with regard to them, so as to bring them into culture with the least expence, and at the same time to draw the most profit from them; for I can scarcely suppose but that some previous operation will be ne-

ceſsary before the surface be ploughed down in the trenching proceſs: and,

Lastly, "I should be glad to have some farther directions than you have yet given respecting the management of graſs land when it is once brought into that state of extreme richneſs you so particularly recommend; for I have no hesitation in saying that the bringing my fields into that state is the ultimate object of my wishes, with a view to free me from the anxiety and trouble that must always, I too plainly see, accompany the practice of the corn grower. A few hints on these heads will complete the favour you have already conferred upon me."

I shall be happy if the following slight elucidations on the subjects proposed shall prove satisfactory to my respected correspondent.

It would be very improper to bury couch to such a small depth as is proposed in the example given, therefore, where this bad weed abounds, the first step in the improvement must be to extirpate it. This may be done by repeated ploughings that go no deeper than the original staple. If the season be dry, this may be done without any other operation than simply repeated ploughings; for in that firm soil, which will run all into clods, these clods, if frequently turned and exposed to the sun and air, will become so dry into the very heart as to kill the roots of the graſs entirely; and, as soon as it is perceived that the roots are quite dead, the trenching proceſs ought to commence, and all the other operations follow as before described. Should the soil be very stiff, however, and the dry weather continue long, it may happen that the clods may be too large to admit of their drying suddenly, as completely as is neceſsary. In that case the

roller and harrow may be called in; but by no means continue their use so long as to reduce the mould into a powdery state, but merely to bring it into small clods. The ploughing, under these circumstances, should be frequently repeated, about once a week, or a little more, between each.

Should a gentle fall of rain happen at an early period while the ground is in clods before the couch roots are dried up, as this will render the clods soft and friable, the ground may be then harrowed; and if more gentle showers fall, so as to soften but not to wet the soil, it may thus be brought, by means of the harrow, to fall into a powdery state, and allow the couch to separate from it, in which case it may be picked up by women and carried off the field. An attentive husbandman will thus be able to avail himself of circumstances as they occur; but at all events the couch must be extirpated before the trenching process be begun; and on every occasion the sooner this is commenced the better.

Perhaps it may not be improper to take notice on this occasion, for the benefit of inexperienced farmers, that couch grass can never be made to thrive unless it be in ground that is frequently turned up by the plough or spade, so that in all cases it disappears after the ground has been suffered to lie a few years in grass; therefore, laying land to grass is an effectual mode of getting rid of this troublesome weed, which has been the scourge of bad farmers in all ages.

In regard to grass fields, where it is intended to deepen the soil by the process already described, it will be always advisable to take one crop of corn at least, in order to rot the sward, before the trenching process

commences; and the crop that will in general give the best return, on poor land especially, and with the smallest expence to the farmer, will be oats. This kind of corn may be sown upon one ploughing from the grafs land, and will in general yield, when thus cultivated, a very large crop. If wheat shall be preferred to oats, the grafs may be turned down by the plough about Midsummer, and, as soon as the sward is a little rotted, ploughed acrofs and harrowed, so as to reduce it to a proper tilth before the time of sowing wheat arrives.

In regard to the best mode of managing grafs-land on a soil that is brought into the highest degree of productivenefs for grafs, there can be no doubt that the most profitable mode of consuming the produce is, in all cases, by having it cut, and given to beasts in the house, and never to suffer a beast of any kind to pasture upon it at all. This, I am aware, is an opinion not yet generally adopted; so that I cannot presume to think that it will be acceded to at once by people who have never deliberately investigated the question. Men in general have been in the practice of seeing grafs employed for fattening beasts in no other way than by suffering them to pasture upon it, and to this practice they adhere without thinking of any other; those, however, who shall take the trouble to examine the facts in proof of the opinion I now advance, that have been stated in the third efsay, Vol. III. of Efsays on Agriculture, will see that it is not upon slight grounds an opinion has been adopted by me that is so directly contradictory to the common practice. On this subject, however, I shall not here enlarge, or adduce additional facts in corroboration of it, as I deem it entirely superfluous.

Let it be remarked, however, and I wish the circumstance never to be lost sight of, that the practice I here recommend can in *no case* be adopted with economy, unleſs when the land is in a state of the highest degree of productiveneſs. I specify this circumstance here in a very particular manner, because I have had occasion to remark that several persons have expreſsed an intention of making the experiments I have recommended in the eſsay above referred to, upon old graſs land that was in a state of prolificacy infinitely short of that which would admit of the mode of management I recommend, with the smallest prospect of economy. This mistake most evidently originates in the indefinite nature of the term I have been forced to employ, viz. *very rich grass land.* Many persons, who have been accustomed to poor pastures, may think graſs land *very rich*, that I should call far short of being in a middling condition. To remove this sort of ambiguity in future, I beg leave to specify that I should account nothing entitled to the term of very rich graſs land that could not afford to pay a rent, including tythes, poor's rates, and all other taxes, of six pounds per acre at the least for the purpose of feeding beasts, and of course beyond the local advantages to be derived from the vicinity of towns or other extraneous circumstances. I consider no land that has not been brought into this state of fertility to be in a condition fit to be left in *permanent* graſs with a reasonable degree of economy; and that, if ever agriculture shall be brought to the degree of perfection of which it is susceptible, every idea of laying down land to permanent graſs, short of this state of prolificacy, will be totally exploded. I am

fully aware, that in the present state of agricultural knowledge in Britain this opinion will, by most persons, be derided as chimerical: but I know upon what ground I here stand, and am by no means under any anxiety for my reputation upon that account. If the experience of future ages shall not confirm the justneſs of it in this island (which, from the present situation of things, I think is very doubtful) I have not a doubt but the experience of some other nation, more fortunately circumstanced in this respect than we are, will do so: my buſineſs here is only to show in what manner the land in question may be managed so as to be ultimately brought into that condition, which I consider as the great object that every farmer who aims at the highest degree of improvement should have at all times in view.

No land of the nature of that of which I here treat can be brought, where irrigation is excepted, under any mode of management, into a proper state for being laid into permanent graſs, till after it has been kept a *great many* years under culture by the plough; for not only must the soil have been first deepened to the degree already specified, which must be a work of considerable time, but after that shall have been fully effected, the soil must be also thoroughly mellowed by frequent ploughing, long exposure to the air, and repeated manuring, before it can be brought into that texture and kindly state which alone can fit it to produce a fine pile of rich graſs for a continuance of years. No attempt, then, should be made to lay such land into *permanent* graſs till after it has been kept a *long time* under culture: nor need this circumstance to give the farmer any uneaſineſs; for, if such land be not in a condition to carry the best graſs, it is, during all

this time, in the very best poſsible state for producing abundant crops of corn: neither is he under any neceſsity to keep the whole of his land perpetually in corn; for, if he so inclines, he may have a large proportion of it in profitable graſs after a few years, should his convenience require it, by laying down a certain proportion of his fields into graſs when in a proper condition for it, as a sort of rotation of crops, to be continued in that state for a few years only, and then converted into corn again; for a soil may be made to produce very abundant crops of graſs for a short time that is by no means fit to produce abundant crops of permanent graſs. By attending to this distinction, land may be thus brought gradually forward in a continued progreſsion of amelioration until it at length attains that high state of perfection which is capable of being laid into permanent graſs of the best quality; and in which state alone it is proper to be subjected to the mode of management I recommend; and under which management I have no hesitation to say that it will yield double the return at least that it could ever be made to afford under pasturage. I know no subject in agriculture that is so little understood as the importance of having graſs land of as rich a quality as poſsible; nor am I acquainted with any error that is more productive of baneful consequences to the community at large than this is. I shall, therefore, conclude these remarks with a few farther directions respecting this branch of rural economy, which, however much they may be disregarded at the present hour, when agriculture is so little adverted to in this country, may come to be attended to at some future period; or in some other country, where the true principles of political economy are better understood than in Britain.

I have already observed, that broad clover may be occasionally admitted as a crop upon soils of this nature with propriety; but this should never be permitted to remain for more than one year; and in all cases this crop may be most profitably consumed by being cut and given green to beasts in the house; a practice that is now very common, and the benefits that result from this mode of management pretty well understood. In regard to this crop I have only one observation more to make, which is, that this kind of clover should never be sown without sowing along with it a small proportion of rye grafs seeds (from one to two pecks per acre). This will be productive of two great benefits; first, it will augment the first crop considerably, and at the same time accelerate the time of cutting about a fortnight, without producing any sensible effect on the succeeding cuttings; and, secondly, it will prevent the growth of the large white daisy *(chrysanthemum leucanthemum)* which generally springs up where clover seeds alone are sown, and greatly injure the crop.

I do not, however, include this annual crop of broad clover in the list of temporary grafs fields. By temporary grafs, I mean such as is intended to remain three, four, five, or six years, according to the circumstances of the soil and conveniency of the farmer, before they are converted into corn land again. If the land be sufficiently rich when laid down to such grafs, it will produce abundant crops all that time without requiring any manure itself, and consequently will afford manure to be applied for the benefit of other poorer fields, and thus tend to accelerate the progrefs of amelioration, while it will at the same time relieve the hands of the farmer, and suffer him to cultivate

other fields without additional beasts or labourers. With this view it ought to be an undeviating principle never to lay down land into this kind of grafs, but when it is as fully manured with dung at the time as can be done not to endanger the lofs of the crop with which the grafs seeds are sowed by over luxuriance; for, though land may be made too rich for corn, I do not think it is pofsible for grafs. The seeds I should recommend for this purpose are white, or Dutch clover (trefolium) about twelve pounds, and rye grafs *(trifolium ripens)* one bushel per acre; along with which may be sown five or six pounds of yellow clover *(medicago lupulina)* or trefoil, as it is sometimes called. The grafs field thus laid down should be rolled in the spring, and made perfectly smooth. It may be cut for the first time about the middle of May, and about once a month at the least during the succeeding season, and always as close to the ground as the scythe can go. This will not only go very far in fattening of beasts, but will at the same time afford a great accumulation of dung, that may be applied towards the improving of other fields. It is easy to perceive that if one half, or two thirds of the farm be constantly kept in this state, there would soon be accumulated upon it such abundance of manure as would accelerate the amelioration of lands to a very great degree. Under this system of management more than double the number of cattle could be kept upon the same extent of ground than it could sustain if laid down in the *usual state* into permanent grafs fields and pastured upon; while it would at the same time produce fifty times the quantity of corn that on an average in some counties their fields now yield.

When the land, in procefs of time, has been so far

meliorated by manures, and mellowed by long continued culture, as to be fit for being put into permanent grafs; after having taken a crop of pease, or other early crop, let the land be brought into complete tilth by frequent ploughing towards the end of summer; and, having given it a very thorough dreſsing of well made dung, so as to render it too rich for carrying a crop of any kind of corn, let the grafs seeds be sown alone in the month of August, and neatly harrowed in immediately after ploughing, and rolled, making the whole field as smooth and even as poſsible, and then shut up the field so as to keep out cattle of every sort: or the seeds may be sown in the spring with barley; but with a determination to cut the barley green, and give it to beasts, should the season prove such as to make it lodge, and thus endanger the grafs seeds. The seeds may be Dutch clover and rye grafs (no red clover) as before, with the addition of three pounds of yarrow seeds per acre *(achillæa millifolium)* and the work is done. It should be cut annually ever after five or six times each season, and kept in the neatest order; no beast being ever allowed to set a foot upon it, unleſs for the purpose of carrying off the crop, and this only when it is dry.

When ground is thus brought into this state of what I would call *maximum productiveness*, no one can easily conceive the population that a country in that state would be capable of sustaining. While it shall be allowed to remain in grafs, it will annually afford a great surplus of dung to be applied to the melioration of other poorer fields, which will be thus advancing in their turn to a similar state of richneſs, while in the mean time they are furnishing annually a great augmentation in the quantity of corn for the

food of man; so long then as any such fields are within reach, it would be uneconomical to break up these rich grafs fields for any other purpose. The quantity of human food from these fields may, however, be greatly augmented by having fruit trees planted upon them. These should be placed in rows at the distance of not lefs than one hundred yards from each other, which would afford warmth and shelter to the grafs, without occasioning a stagnation of air that could prove hurtful. With this view the trees should be planted pretty near to each other in the row, so as to form a continued screen when young, interspersing cherries and other short lived trees between those of larger size and more permanent duration, which, being taken out when they become too close, will allow the permanent trees to spread out when they come into bearing; and, as no tree that suits these climates affords such abundance of wholesome and nourishing food for man as the sweet chestnut, when judiciously grafted, these trees may be planted as the permanent crop wherever the food of man is the principal object. Under this arrangement there can be no doubt that such grafs fields would support a more abundant population than the very best corn fields now can do.

Should a system of this kind be steadily persisted in for a sufficient length of time till whole districts, instead of small patches, were converted into this state, the country would then be brought into a situation that would admit of being cultivated universally by the spade, so that the use of beasts of labour might be in a great measure dispensed with. The food that these beasts must at present consume would, of course, admit of being applied to the use of man. A popula-

tion perhaps ten times more numerous than we have at present would then be employed in the peaceable and steady operations of the field, which, under judicious laws, would afford materials for trade and manufactures to an indefinite extent; while all the persons employed in the numerous occupations to which these gave rise would find food in abundance, and to spare, brought to their hands at all times. What a difference between that state of things and the present!!

It is with pleasure that I embrace the opportunity that is given me before the present volume of this miscellany is finished, to develope thus fully my ideas on this important subject, and thus to afford an evidence more satisfactory than could have been by any other means afforded, that the alarms which have been raised by the speculations of ingenious but ill-informed men, respecting the inability of this country to support its present or probable future state of its population, are entirely unfounded. Had I merely aſserted, as indeed I have done, from my own knowledge of the facts here brought to light, that this country could maintain A HUNDRED TIMES its present population, it would have been considered as one of those vague and unfounded aſsertions which are now so common, and therefore disregarded; but after having traced the progreſs by which this melioration may be effected through every step in that progreſs with a minute attention to every particular, so as to render it impoſsible for any person who is acquainted with these things to alledge that any thing that is there said is not easily practicable, the demonstration becomes so complete as not to admit of a doubt in any ingenuous mind. No one can doubt, that if a field

of poor strong land were subjected to the management that I have directed, and continued for a sufficient length of time, but it might by degrees be brought to yield not only a hundred times the quantity of human subsistence that it now yields, but perhaps ten times more than that; as I myself have actually witnefsed in more instances than one: and what can be done with one field when physically considered, doubtlefs can be done with any number. Let those, then, who deliberate on the welfare of the community think of these things, and draw the necefsary inferences. How far, however, are we, alas! from having attained the state of mind that admits of this kind of serious and unbiafsed deliberation.

Men who have not been accustomed to examine minutely into the real state of things, but to content themselves with vague notions casually adopted, can neither form a distinct notion of the *possible* effects of particular arrangements, nor of the actual state of things that have taken place on this globe, which have been attested by the concurrent testimony of all authentic historians. There are few who have read the ancient history of Rome who do not know that Cincinnatus was called from the plough to head the Roman armies in a case of extreme difficulty and danger; and that, after having restored the public tranquillity, he laid down his dictatorial authority, and retired once more to his peaceful cottage to resume his rural labours; but few know that the whole of his patrimony, from which he drew subsistence to himself and family, did not exceed the extent of two acres and a half of land. What the number of his family was we cannot well say, but it can scarcely be supposed to have been lefs than five persons. This fact goes far to prove

that two acres and a half at that time afforded abundant sustenance to five persons, and more; for out of the surplus of their produce they must have had wherewith to purchase clothes, and some other neceſsaries. We have no reason to think that his portion of land was better than the common, or that it was deemed extraordinary that it should support the family, for no notice is taken of either of these circumstances. At that time, then, the Roman territory on an average could support a population nearly to the same degree over the whole. At a future period, however, it is well known that the Roman people, who were not then probably more numerous, were obliged to depend upon foreign nations for their principal support; and Italy at this day can scarcely find subsistence for one half its then population. The productiveneſs of a country, therefore, neither depends upon the soil nor the climate so much as on the industry of its people; and the plenty or scarcity will depend more on those political arrangements, that tend to direct into a proper channel, or the reverse, and to cherish or repreſs the legitimate exertions of industry, than any thing else. Among the many examples strongly illustrative of the truth of this position, the state of Britain at present aſsuredly claims its place.

N. B. *Let it be specially remarked, that in all I have said respecting the application of lime in this essay, it is to be understood that the owner of the field shall have previously ascertained, by actual trial, that lime acts upon his soil as a meliorating and powerful manure; for I am sufficiently aware, that there may be some soils on which lime will not act at all as a manure; and, though such soils be comparatively rare, common prudence requires, that before such a heavy expence as the kind of liming I have recommended shall be actually incurred, there shall be a* certainty *that it will prove efficacious, which can in all cases be ascertained at a very small expence, if adverted to in due time.*

ON THE USES OF THE ROBINIA PSEUDA ACACIA IN FENCING.

I HAVE just now made a discovery of great importance in agriculture, which I make haste to communicate to the public. The acacia tree, commonly so called, that is, the robinia pseuda acacia, is known in this part of the country, where it is chiefly cultivated as an ornamental tree; but it is scarcely known at all in other parts of the country. On this account it only of late attracted my particular notice; nor did I know the peculiarities respecting its culture until a few days ago, from which I became fully sensible of the uses to which it may be applied in rural affairs.

No one department of farming business is attended with more trouble and expence than fences. The best fences that have hitherto been reared by good farmers, are those made of the white thorn; and these, when the soil is good, and the climate moist, under good management, make excellent fences; but their progress at the best is slow; and, where the soil is thin gravel or sand of a poor quality, it is next to impossible to make them thrive. The acacia, on the contrary, grows luxuriantly, and advances with a rapidity that is equalled by no tree that I know in this country, especially upon gravelly or sandy soils: its young twigs are covered with a kind of thorn that renders them terrible to animals of all sorts, but these thorns are not permanent; like the prickles of the furze, they drop off as the branches become large, and the stem of the tree, when it advances to the state of a tree, is entirely free from them.

The acacia, like broom or furze, sends down long fibrous roots, which descend deep into the ground,

and do not well admit of its being transplanted, unleſs it be when very young. It is raised from seeds; and the best mode of rearing a hedge is to sow these seeds in the month of March, in the place where they are to remain. If the seeds can be had in abundance, they may be sowed in a drill, as pease, dropping the seeds about three inches apart; but where the seeds are not to be had in abundance, they may be planted by hand (first taking the precaution to plunge them in water, in order to separate those that are so light as to swim) about six inches apart from each other, and then covering them carefully. The seeds are of such a size as to admit of this being done with ease; and they vegetate so freely, that with ordinary precaution scarcely one of them will fail. When they come up they must be kept clean and free from weeds, and they will rise in any ordinary soil, that has been properly dug and prepared for them, to the height of three feet, more or leſs, the first season. The shoots are quite straight and thick, and strong in proportion, so that, by the end of the second year, many of them will be from seven to eight feet in height, and as thick as a man's thumb. They continue to advance with great vigour for many years, till they attain the size of a large tree; which affords a strong and durable wood fit for every purpose where strength and durability are required: in respect to which last quality it is in some respects said to be unrivalled.

As the wood is of so much value, I should recommend that they should be trained so as not to injure the timber. With that view, if the seeds are sown too thick, they should be thinned the first year so as not to be closer than six inches asunder. The side shoots, many of which will grow from four to six feet

in a season, should be cut off once a year quite close to the stem. The best time for lopping this tree is the month of April. About the third or fourth year, when the stems will be nearly as thick as the wrist, every second stem should be cut within an inch or two of the ground, with a view to give those that remain room to advance. Those that are cut over will send out shoots six or eight feet high the first season, so as to fill up the opening completely in a few months; while the others will rise into trees with great rapidity. Of this circumstance some judgment may be formed from the following measurement of a tree now in my garden. It is, by the information given me, six or seven years old from the seed, and was transplanted: two stems were allowed to remain after being cut over. The largest measures, at five feet from the ground, nineteen inches; and the other thirteen in circumference! The smaller shoots may be cut down as often as expediency will require; and it will not be long before the larger trees will increase so as to touch upon each other, when they may be cut down, and the hedge renewed by merely suffering as many of the shoots to rise as shall be judged convenient. Fences of this sort, I am assured, are very common in some parts of Germany, which prove an insuperable obstruction to huntsmen, and are therefore grievously complained of by them. What an excellent fence for orchards!

I need not waste words in pointing out the benefits that may be derived from this kind of fence; I need only observe, that as seeds of this tree can only be had in this country in the neighbourhood of London, where the trees produce abundance of seeds, it will be from thence only they can be had; and, as the seeds have not yet been in great demand in this country, so as to

be kept commonly in the seed shops, those who want them for next season in quantities should give their orders in the month of June, that they may be collected; and be particularly careful that you get *seeds of that year*; for if they be longer kept many of them fail. Should many seeds be demanded, they may be had from North America; but in that case the orders should be given early, that it may arrive before the seeds be shaken, which is usually in the month of July.

The following remarks on made wines were communicated by a gentleman of great accuracy of research, and deserve the attention of the public.

THE vinous fermentation is that operation by which the saccharine quality of vegetables and their fruits is converted into alcohol or spirit, which alcohol or spirit may be separated pure from the matter so fermented by distillation, and again afterwards re-united with other liquids. From the moment the fermentation begins, the saccharine quality commences its change; but various causes will interrupt and obstruct it so as to leave the fermentation imperfect. In proportion as the fermentation succeeds, the quantity of alcohol will be increased, until the whole of the saccharine is changed, when no longer any sweetneſs remains, but a liquor of a strong intoxicating quality, being a mixture of spirit and aqueous liquid. A gentleman tried sugar with water, but it would not ferment alone; he chopped a certain quantity of vine leaves, and threw it into the mixture, and it brought on a perfect fermentation: hence I learn that an acid is neceſsary in the vinous fermentation. I made two twenty-gallon

casks of currant wine; to one I put twelve gallons of currants, to the other only nine; that wherein the twelve gallons of currants were put fermented most, had the highest vinous flavour, and was brightest in the glaſs, but the other was the sweetest: here we see the sweets arose from an imperfect fermentation, the saccharine quality being not all changed into alcohol; hence arose its deficiency in brightneſs. The saccharine quality unchanged keeps the wine in a viscous state, and prevents its falling clear; hence I learn there is wanted a certain quantity of acid to perfect the fermentation. All fermented liquors, under a certain degree of strength, or not having a sufficient quantity of alcohol, will grow sour; hence we see the neceſsity of all foreign sweet white wines having so much brandy put into them; the fruit being exceeding sweet, and deficient of an acid, renders the fermentation imperfect, consequently liable to turn sour without an additional spirit; hence we see the neceſsity of making gooseberry wine before the gooseberries begin to turn soft, and consequently while there still remains a considerable degree of acidity in the fruit. Currants, even when fully ripe, have still a sufficient degree of acidity for the purpose of fermentation.

Though I am satisfied with the justneſs of these remarks, as far as they go, yet I am inclined to suspect that there are other circumstances, besides mere acidity, which contribute towards the perfection of fermented liquors; and the subject would require more full elucidation than it has yet obtained to remove all the difficulties that occur. There seems to be little reason to doubt that mere sugar and water may, by

fermentation, be converted into a vinous liquor. The extract of malt is sweet only, and discovers no tendency to acidity; yet it ferments very well. Potatoes boiled ferment very well, and afford a vinous liquor, though this root discovers very little of either sweet or acid matter: nor can it be made to ferment, in as far as I know, when it begins to grow, and is thus rendered sweet by a proceſs somewhat similar to malting. In some of the richest foreign wines the grapes, if I have been rightly informed, are suffered to attain their fullest maturity, when the grapes have a more luscious taste than the sweetest gooseberries known. There seems to be some other principle in fruits besides the mere saccharine and acetous qualities, which contribute to the perfection of fermented liquors made from them. Many of the best cyder apples and pears, that make the richest perry, are observed to poſseſs a peculiar roughneſs or astringency very different from acidity, which is supposed to contribute to the goodneſs of the liquor.

Notices of a singular Animal, lately discovered in New South Wales, with a figure.

I am happy in being able, by the obliging kindneſs of Dr. Buchan, to favour my readers with an account of an animal of a very uncommon kind, that is as yet but very little known in Europe, that will, I doubt not, prove satisfactory to every reader. The figures were drawn and engraved by John Anderson. It seems to be one of those links in the chain of nature that are so universally found to connect different claſses together, so as to prevent the poſsibility of pointing out the precise boundaries that separate the one from the other. It is evidently of the order of quadrupedes, approaches nearly to the claſs of the amphibiæ, with an approximation in the head especially to one species of water foul. In its bill and fore-feet the resemblance to those of a duck is

singularly conspicuous. But as its feet are evidently intended not only to be employed in the water as an oar, but as an implement for digging, as occasion may require, the web, which, when it is used as an oar, is strengthened by the claws, by being connected with these claws for little more than one-third of their length, is evidently susceptible of being contracted at pleasure so as not to prove an obstruction to the toes when they are employed in digging; a conformation, in as far as I know, peculiar to the animal. As its conformation and habits seem more nearly to resemble those of the mole, than any other animal, perhaps it might with some propriety be called the *duck-billed*, or the marsh mole.

The representation of this animal, whose appearance has given it a just title to the appellation of *extraordinary*, is taken from the first specimen that reached this country. It was brought by an officer of the Ceres indiaman, which ship arrived here October 1798. He bought it, together with some other articles of natural history, at Canton, from an officer of the Britannia, which had sailed from England with convicts for Botany Bay, and had just arrived in China. The only account he could give of it was, that he had it from a serjeant who brought it with some other articles from the interior part of the country. Two years elapsed before any other specimen found its way to Europe. Latter accounts speak of it as the inhabitant of some inland lake.

From this specimen Dr. Shaw took his description (vide General Zoology, vol. i. p. 66). He has there named it PLATYPUS ANATINUS. His account of it, to which we refer such of our readers as cultivate natural history as a science, is in general accurate, excepting that he has mentioned the eyes as being below the patch of light-coloured hairs on each side of the head, whereas their real situation is exactly above the upper line, on the anterior part of that spot. It is probable that, when alive, they are not more visible than the same organ of the common mole of this country, to which this animal in many respects bears a close analogy.

By professor Blumenbach this animal has received the perhaps more appropriate name of *Ornithorynchus Paradoxus*. Under this title the anatomy of the head has been investigated with much accuracy by Mr. Everard Home, in the Philosophical

Transactions. He has there proved, that the striking resemblance to the bill of the duck is only an external feature. The apparent beak being, in fact, an extension of the bones of both the upper and under jaw, covered with a thick skin terminating in a kind of lip. The extension of the bone of the upper jaw gives room also for an enlarged structure of the organ of smell, which in this animal is very complicated, and probably subservient to its peculiar mode of life.

The structure of this animal is sufficiently marked to enable us to form some probable conjectures relative to its modes of existence. Its food is most likely worms, and the larva of insects existing among mud, as the common mole is known to subsist on the same matters which it finds among the roots of plants*. The membrane extending beyond the claws of the fore feet, which it probably poſſeſſes some power of occasionally retracting, is evidently calculated to facilitate its progreſs through water; and the ſingular ſhield that extends from the root of the bill appears to be formed in order to prevent the fine fur of that part from being injured, when forcibly thrust into sand or gravel in pursuit of its prey. The fur has a peculiar oily appearance on its surface, probably repulsive of water.

In common with the other animals of New South Wales, which, as well as the plants, are distinguished by some peculiarities of structure, differing from those of every other part of the world, this creature has a singular strength of tail, which,

* In order to rescue the mole from that universal state of unmerited persecution which it has universally undergone in this country, founded on the erroneous opinion of its destroying the roots of vegetables; I am happy to be able to add the following testimony respecting the real nature of its food, to the ingenious eſsay by E. Jones, Esquire, of Flintshire, published in the 19th vol. of the Transactions of the Society of Arts. A friend of mine kept a mole for several months in the bottom of a veſsel, covered with moſs, and this little animal, so timid and shy in its natural state, gradually became so tame as to come forth at a call to receive its food, which invariably consisted of earth worms and slugs. Its favourite prey, in a state of nature, appears to be the larva of the cockchaffer, that unconquerable enemy of all foliage. The means employed by nature to maintain the due equilibrium of created beings are admirable, and the interference of man does harm at leaſt as frequently as good. The mole ought to be cherished and protected as the great destroyer of slugs, worms, and caterpillars, those enemies of vegetation, instead of being persecuted and destroyed as it is at present.

like that of the kangaroo, appears rather an extension of the spine than an appendage to the body. This peculiarity appears to have induced Dr. Blumenbach to claſs it with the otter, but in all its other habits it closely resembles the mole.

No appearance of mammæ having been discovered in any specimen hitherto brought to this country, has induced some naturalists to conjecture that it resembles the feathered race in being oviparous, as well as in the formation of its bill. But it is more probable that the parents employ this organ in the same manner as birds, to supply their young with the food requisite in the earlier stages of their existence.

The various specimens of this animal, which have reached this country, being of different sizes, render it impoſsible at present to determine its natural magnitude. The individual, from which this cut is taken, is eighteen inches long, but we have seen some exceeding two feet. We have no hesitation in saying, that this representation is the most faithful that has yet been published in this country. Although it be taken from the same specimen that Doctor Shaw's print is engraved from, it was at that time little better than a dried skin, which has since, by the ingenious exertions of Mr. Dobson, an amateur of natural history, been extended, its various parts brought out and prepared so as to resemble life. In this state it is now in the poſseſsion of Dr. Buchan, of Store-street, Bedford-square.

It is almost needleſs to add, how well the art of engraving on wood, in its present improved state, is calculated for giving a faithful representation of such subjects.

To the Readers of this Work.

On the close of the present volume I find it neceſsary to apologise to my readers for a small deviation from the plan I wished to have pursued; but which, for the reasons I shall state, I find it expedient to depart from on the present occasion.

When I had it in contemplation to commence this work, two discouraging circumstances occurred that made me hesitate respecting it. The first was, that, as I had determined in my own mind not to allow any consideration whatever to induce me to write in it a single line that I did not conceive might be useful in one respect or other to that claſs of readers for whom it was chiefly intended, and at the same time to be equally free in condemning whatever should appear to me to have a per-

nicious tendency upon the public mind, regardless of what quarter so ever it might come from, I was afraid that a mode of writing that so little accorded with the general practice might obtain so little favour with the public as to frustrate the intention, and render the plan abortive; for though a satisfactory recreation to the mind, rather than pecuniary emolument, was the gratification I had chiefly in view, yet I was not so imprudent as not to be aware that full indemnification was necessary. In regard to this particular, the extreme indulgence of the public, on which, from former observation and experience, indeed, I placed some reliance, soon removed all anxiety; and I have now the satisfaction feelingly to know, that where the public are satisfied of uprightness of intention alone, every possible indulgence in regard to other particulars will be granted with a more cheerful alacrity than it could be demanded. My own example is a particular and striking proof of this fact; and I am proud to have this opportunity of stating it, that it may prove a stimulus to others to follow an example that may be so easily attained by any one who chooses it. To be honest is the most natural propensity of the human mind; and could every young person be but fully convinced of this first of all truths, *that honesty is the best policy*, it could be only through inattention that they would casually deviate from it.

The other particular that made me hesitate about engaging in a periodical undertaking, was the fear that a work conducted by one, to whom the bustle of transactions with other men is the highest annoyance, might be so neglected in the executive departments, when confided entirely to others (especially to men who I knew had been in the general practice of transacting business with irregular and bustling persons), that it might not obtain that degree of attention which I knew was necessary for my own quiet. These considerations, after hesitating long, induced me to adopt a plan for the work which, by making it have no connexion with the transactions of the day, might admit of its being printed a month before as easily as on the very day of publication; and, having communed with a respectable printer, of whose dispositions I entertain a very favourable opinion, and communicated to him in the clearest manner I was able my feelings and my wishes in regard to this particular; and finding that his opinion coincided entirely with mine, not only in regard to the practicability of the plan I proposed, but also the great conveniency it would afford to himself in particular, I was at last induced to begin the work. But I now find that it has been impossible to get it executed after the manner I had hoped. Feeling myself thus exposed to a perpetual and irritating harassment, and liable to the imputation of being neglectful of my engagements, and disrespectful to readers who have merited, at my hand, on every occasion, the utmost possible degree of attention, I came at length to a resolution of discontinuing the work, solely on this account, at the end of the fourth volume; and with that view brought it to the kind of close I there gave it; and it was only in consequence of the intreaties of some particular friends that I was, with much hesitation and reluctance, I own, prevailed upon to resume it once more. Another year has now elapsed, and things continue in the same state in regard to this particular as before. Thus circumstanced, and chained, as it were, to the oar, so as to be debarred the power of every necessary relaxation, I shall trust that none of my readers will accuse me of levity, or the smallest disrespect to them, when I announce to them that the work is to be for the present discontinued. And, as I think it is by no means probable that I shall be ever able to devise arrangements that will be sufficient to prevent the re-

currence of similar distractions, I have endeavoured so to conduct matters as to bring every subject of importance to a general close in this volume that has begun to be discussed. It behoves me, however, at the same time to observe, that it seems to me in no way surprising if men who have been accustomed to transact business in a bustle of confusion, on account of derangements respecting copy, and other circumstances of that sort, should not be able to feel in a strong degree the extreme unpleasantness that arises from similar derangements in the minds of others. For my own part, however, this I have felt in so strong a degree, that I am conscious the very uneasiness of these sensations has greatly diminished the value of the work; nor could any pecuniary gratification be deemed by me in any sort as an equivalent for it. Thus have my readers had reason to complain of a breach of conditions by me, when in truth these defects arose from causes that I could not prevent. I judged it necessary to state this circumstance merely as an apology for seeming neglect, which occasioned blame that, in as far as respected me, was unfounded.

It is impossible for me to find words to express in a forcible enough manner the sentiments of respect I feel for the continued and extraordinary indulgence of my kind readers for the defects (too numerous, though certainly unintentional) in these volumes. I shall ever feel a pleasing sensation in the recollection of it; and I shall never cease to regret that I have thus been deprived of a recreation in which I could have continued to take delight as long as the mind was capable of its usual exertions; one fear I shall thus escape, that of continuing the exertion after the powers had failed.

During the relaxation that I shall thus obtain, I do not, however, propose to remain entirely idle. While health is preserved, it is the duty of every human being to employ that health to the best of his abilities in some useful undertaking; and to this rule it is my wish ever to adhere. There is one subject that has for a long period of years attracted my notice in a very particular degree, and which does not yet seem to have obtained such accurate elucidation as its importance requires, that is, the *system of legislation, or civil polity, that shall be the best calculated to promote domestic felicity among the great body of the people, to guard against internal discontents, civil disturbances and revolutions, and to avoid wars with foreign states, and the obtrusive interference with external politics.* If a system of legislation and government can be pointed out that has these natural tendencies, it would certainly be a discovery well deserving the attention of mankind. The subject has so often attracted my notice, as to induce me to be satisfied that the object is physically attainable; not by means of revolutions and destructive convulsions, but by the gentler influence of regulations that have a silent tendency to operate upon the heart and affections, and thus to influence the actions and habitudes of men. The present critical state of Great Britain, and the unfortunate situation of all the other nations in Europe, who, by pursuing too long a system that has a very different tendency from the above, has led me of late seriously to think of that subject much oftener than formerly; and the more I think of it, the more I am convinced of the utility, if not the necessity, of the disquisition announced above. It is my intention, then, to employ the leisure that I shall thus obtain in collecting facts respecting that subject, and in so arranging them that, in case of death happening before they can be published, some use may be made of them by others. As I consider all speculations on legislation or government, that do not rest upon the solid basis of authentic facts, as

vain, delusive, and dangerous, I shall put dependance on no reasoning that does not rest upon well authenticated facts; my business, then, will be to search out these facts with care, with a view to avail myself of the lights that these shall suggest. A painful attention for nearly fifty years past to the important events that have taken place in Britain, independant of historical researches, has thrown a great deal of light upon the subject I have contemplated; nor will it perhaps be necessary for me here to tell my attentive readers, that much must depend upon the cherishing a spirit of agriculture and a taste for rural employments, without which the frequent recurrence of scarcity must inevitably lead to internal disturbances, foreign contentions, and final depopulation and debility. Although I am now but too well acquainted with the causes of these evils here, there are still some established facts which prove, practically, the power of resisting, under certain circumstances, the influence of these evils; but the circumstances which have thus operated are not as yet sufficiently known to me. To obtain this information so much wanted, I can be satisfied with no information but that which is derived upon the spot. It is then my intention, if the peace that all Europe so much requires shall be established, to go over to the Netherlands, there to study the agriculture of that fine district among the people themselves who practice it; there to examine their history, laws, civil economy, and customs, by means of which, when jointly compared with each other, and enlightened by those minute circumstances in common life that never find their way into books, I think it is not impossible but I may at length attain the knowledge of the cause of one fact that contradicts the experience of all other nations; for, in as far as I know, Belgium is the only country on the globe in which commerce, manufactures, and agriculture, have been all three carried to a very high degree of perfection, and in which agriculture has continued to prosper with unabating lustre for many centuries together. This is a singular and solitary fact in the history of nations; and, if the causes of it can be distinctly ascertained, it will prove one of the most useful disquisitions that hath ever been investigated. Pains and attention at least shall not be wanting on my part; for I shall prosecute it *con amore*. If this fact can be ascertained, a subsequent excursion through France, Spain, and Italy, by exhibiting a striking contrast, would throw farther lights upon the subject, by pointing out perhaps a variety of imprudencies that wisdom ought to shun.

Such are the ideas with which I at present amuse myself; but whether I shall be permitted to accomplish this task, will depend upon circumstances that I cannot at present ascertain.

Thanks to Correspondents whose pieces have been delayed for want of room.

INDEX.

A.

Aberdeen, account of the surprising improvements in agriculture there, 457.
Acacia, its uses in fencing, 557.
Addreſs, concluding, to the readers of this work, 565.
Addreſs to the clergy, a serious one on the subject of tythe, 504.
Adverbs, nature of that claſs of words, 86.
Aeriform fluids converted into solids, instances of, 330.
Adjectives, nature of that claſs of words, 85.
Agote, Mr. his observations on Kanghy's will, 187.
Agricola, his queries respecting a farm, 241—answers to by the Editor, 244.
Agriculture, the profits in it leſs than in other buſineſses, consequences of it, 454.
Agriculture of Scotland, the flourishing state of owing to the absence of tythe, 448.
Agriculture, cautions respecting experiments in, 281.
Alder shoots, uses of the pith in them, 148.
Alloa, notices of, 212.
Alphabetic mode of writing characterised and distinguished from the symbolic, 12.
Anecdote, an electioneering one, 112.
Annexes and prefixes to words, their uses, 168.
Antiquity of tythe does not free them from the power of parliament, 439.
Apology to the readers for the discontinuing of this work, 565.
Arabic numerals a discovery of late date, 6—a kind of symbolic writing of universal application that is understood by all nations, 11.
Arbuthnot, Mr. his curious sea baths and fish ponds, 524.
Arundinaceous plants, beautiful economy of nature for strengthening their stalks, 145.
Asiatic forms of government, remarks on, 182.
Ayeen Akbery, extracts from, 61—directions for the viceroy, 61—the general, 66—the judges, 67—the superintendant of police, 68—the collector of the revenues, 121—the accountant general, 128—the treasurer, 130.

B.

Bagdad, account of by Olivier, 28.
Baltic, a herring fishery there in former times, 517.
Baths, sea, a discovery of a new and elegant sort, 524.
Bean crop, directions for cultivating it, 390—its straw a nourishing food for horses, 391.
Bedford, duke of, notices respecting him, 539.
Berwickshire, a farm in great improvement on it, 458.
Boarding schools, the defects of these fashionable seminaries, 408.
Breakfast in Scotland, a rural one described, 262.
Breeds of herrings different, 507.
Broom-loch, its herring fishery, 517.
Bruce, K. Robert, his interview with Wallace, 105.

C.

Carron iron works, account of, 108.
Carse of Stirling, account of, 108.
Castle Campbell, a singular remain of the baronial state described, 217.
Cattle, a battle among, a remarkable trait in the natural-history of that animal, 468.
Cattle, inquiries respecting them, 199—answers to ditto, 201.
Cave Beck, his treatise on the symbolic character mentioned, 319.
Causes of the partiality for short leases, 54.
Changes in the state of a country, though imperceptible as they occur, become in time the cause of great national derangements, particularly illustrated, 42.
Character, by a lady, 398.
China, a beautiful specimen of the sim-

plicity of manners and mild government in that country, 196.
Chinese, national prejudices of, 181.
Chinese mode of writing of the symbolic kind, 18—the verbal language of China often confounded with the written language, 19—absurdities propagated respecting that language refuted. 19.
Cincinnatus, his small patrimony, 555.
Clayey soils, observations on the means of ameliorating them, 244—general maxims respecting them, 1st. they cannot be cultivated with advantage when in a state of poverty, 245—2nd. the grafs on such a soil when poor grows worse, 245—3d. when deepened and enriched they can be continued in culture or grafs with profit for an indefinite length of time, 246—great expence must be incurred in cultivating them, 247—the drawing of tythe an obstruction to such cultivation, 249—hurtful effects that result from thinnefs of soil, 251—beneficial effects of deepening it, 252—neceffity of deepening the soil, 255—directions for doing it, 256—lime, as a manure, directions for applying it, 258—quantity of lime required, 259—the application of a roller for reducing the clods, 382—directions for laying the ridges, 383—a particular kind of narrow ridge, how to be made, 384—ploughing, the Eſsex mode described, 385—objections to it, 386—how it may be best performed, 386—deep ploughing not neceſsary, 388—crops best suited to that soil, 388—dunging, quantity neceſsary, 389—drill to be drawn by the plough, 390—bean forage nourishing food for horses, 391—wheat drilled, though similar to a broad cast crop, 392—extirpating couch grafs, how to be done, 393—different horse-hoed crops that may be adopted, 394—a second deepening of the soil, when neceſsary, to be repeated, 395—to be still farther deepened before it can be laid into permanent grafs, 397—additional observations on, 543—on the means of eradicating couch from them, 544—on laying such fields down to grafs and general management of, 546—such soils cannot carry grafs of the best quality unleſs it has been kept long in tillage, 548—clover, broad, should only be kept for one year, 560—temporary grafs fields neceſsary, 551—permanent grafs the ultimate object to be aimed at, 552—the vast population a country in this state could sustain, 554—the small patrimony of Cincinnatus, 555.
Clergy of Scotland, their character, 497.
Clergy, the influence of in England diminished in consequence of tythe laws, 496.
Converſation, an eſsay on, 401—causes of the imperfections of it, 403—defects of modern education respecting males, 406—and females, 408—how these defects may be remedied, 410—reading, in what way it tends to improve the talent for converſation, 412.
Corn, a table of the exports and imports for the last century, 364.
Corn laws, their tendency on agriculture stated, 48.
Correſpondents, to, 240.
Couch grafs, mode of cultivating clayey soils so as to prevent its increaſe, 393—directions for fully extirpating it, 544.
Crack of the herrings, a singular phenomenon respecting that fish so called, 520.
Crops best adapted to a clayey soil, 388.

D.

Death of the duke of Bedford, on the, 539.
Debaſement of money, notices of, 308.
Decreaſe in the value of money, its effects on rural operations, 44.
Dee river, singular progreſsion of eels observed in it, 421.
Deepening of clayey soils, neceſsity of, 253.
Despotic governments characterised, 183.
Devil's-bridge over a tremendous chaſm, 267.
Devon, the falls of described, 266.
Diaphanous fluids converted into opaque solids, 330.
Dictionary for the symbolic character, excellency that it must poſseſs, 169—a proposal for getting it done by subſcription, 312.
Difficulties that attend the practice of agriculture, 396.
Dirom's eſsay on the corn laws, 45.
Diverſities of plants, on the, respecting size, durability, and other circumſtances, 131—the baobob tree of Africa, its immense size, 132—infinite minuteneſs of mould, 133—the longevity of the first contrasted with the short life of the last, 134—the baobob tree described, 136—its longevity, 139—used as a medicine and condiment, 142—the wood soft and spungy, 144.
Dollar, the village of, 216.
Drill to be drawn by the plough, its uses described, 390.

Duck-billed platypus, account of, 562.
Dung, quantity required for a clayey soil, 389.

E.

Economy of nature, singular respecting herrings, 515.
Education, modern, the defects of, 401.
Education of girls, importance of by bishop Fenelon, 148.
Eels migrate at certain seasons, 421—a singular phenomenon respecting them described, 421—they descend towards the sea, 425—a mode of catching them in great numbers, 426—a remark respecting the eels at Loch-schen, 427.
Electioneering anecdote, 112.
English and Scottish monies, tables of their respective value at different periods, 291.
Esprit du corps, meaning of that phrase, 349.
Essex, Mr. Howlett's exaggerated account of, quoted and commented upon, 266.
Experimental agriculture, hints on, 280.
Exports and imports of corn, a table of, 364.
European nations, their prejudices, 181.

F.

Falkirk, notices of by Viator, 105.
Farm, queries respecting, 241—answers, 244.
Farmers in Scotland, their situation described, 446.
Females, observations on the education of, 148.
Females, education of, defective, 408.
Fence, an excellent kind described, 557.
Fenelon on female education, 146—203.
Few, an ancient mode of tenure so called, 210.
Fifeshire herring fishery, 518.
Fishes of some kinds derive their sustenance directly from water, 326.
Fishes, reflections on the natural-history of, 321—longevity of, 322—their food, 324—herrings derive their food directly from water, 334—on the migration of fishes, 415—of the salmon, 415—ditto of eels, 421—ditto of herrings.
Fish ponds, a new and valuable sort, 424.
Fleet-ditch sewer, striking absurdities in the construction of it, 74.
Fluids converted into solids, 330.
Food of fishes, inquiries concerning it, 324—generally carnivorous, but some kinds draw their food from water only, 328—particularly herrings, 334.
Forsyth, Mr. Knight's account of his discoveries respecting fruit trees examined, 525.
Forth, Frith, of its herring fishery, 518.
Fragment of verses, humorous critique on, 371.
Fruit-trees, a difference in opinion respecting them between Mr. Knight and Mr. Forsyth investigated, 525.

G.

Gender of nouns, observations on, 97—and pronouns.
Geological observations on the formation of soils, 221.
Glen-devon, its rural beauties noticed, 214—the agricultural state of this rural district, 270.
Gold, a grain of may be extended 2900 feet, 239.
Golden pippin, Mr. Knight's opinion respecting that tree examined, 531.
Gothenburgh herring fishery, 517.
Governments, different sorts of characterised, 183.
Grammatical classification of words, their nature and origin explained, 84.
Guicciardini's account of the migration of herrings erroneous, 429—his account of their appearance, 515—king of, 521.

H.

Haddocks, a remarkable circumstance respecting them, 506.
Haddock, its remarkable docility, 524.
Hamilton of Bothwelhaugh, account of, 103.
Herrings derive their food directly from water, 334.
Herrings, on their migrations, 428—the popular account of detailed, 430—reasons for thinking it erroneous, 432—continued, 505—they do not depart far from their usual haunts, 507—different *breeds* of herrings, 507—described by Mr. Macdonell, 508—his description of their progress in certain cases, 509—general notions concerning their various movements, 510—they breed in all our seas at every season, 512—it withdraws itself from the shores at particular seasons, going to the bottom in deep water, 512—they deposit their spawn chiefly in deep water, 515—where the young fry are protected from other fish, 516—they sometimes desert a station entirely that they have long frequented, and come to others where they were not before known, 517—notices of different kinds of herrings, 519—crack of

the herrings described, 520—mode of fishing herrings, peculiarities respecting herrings thus discovered, 522—play of the herrings described, 528.
Howlett, Mr. his pamphlet on tythes examined, 345—aſserts that they do not obstruct agriculture, 348—his mind under a partial bias, 353—his position contested by a simple statement, 356—this position proved by Mr. H's own statement, 357—particularly when the clergy are concerned, 358—his statement respecting hops proved to be fallacious, 360—a table showing the increase and decrease of corn for the last century, 364—his account of Eſsex quoted and commented upon, 366—much land has been converted into graſs from corn of late years, 368—his arguments on the antiquity and legality of tythes examined, 438—curious quotation by examined, and shown to be perverted, 444—the flourishing state of agriculture in Scotland, 446—owing to the absence of tythe, 448—profits on agriculture leſs than in other buſineſs, 446—destructive consequences of it, 454—English agriculture has much declined in consequence of tythe, 456—surprising improvements in Aberdeenshire, 457—and Berwickshire, 458—continued, 482—abstraction of straw by tythe, the consequences of considered, 482—rent and tythe operate differently, 486—tythe the cause of party disputes, 487—it affords a powerful temptation to the clergy, 489—the difference between the clerical influence in Scotland and England stated, 496—a serious addreſs to the clergy on the subject of tythe, 504.
Hieroglyphic mode of writing characterised, 12.
Home-bred herrings, meaning of that phrase, 509.

I. J.

Index Indicatorius, 71—observations on the improvements on Snow-hill, 72—Fleet-ditch and Bridge-street, 74—on levelling ridges, 75—Mr. Perkins's tractors, 76.
Importation of corn, consequences of, 50.
Imports and exports of corn, table of, 364.
Improvements in agriculture about Aberdeenshire surprising, 457—and Berwickshire, 458.
Jurisdiction act respecting Scotland, the salutary influences of it, 441.

K.

Kang-hy, emperor of China, his will, 190.
Knight, Mr. his treatise on fruit-trees, observations on, 525.
King of the herrings described by Guicciardini, 521.

L.

Language, disquistions on, 1.
Language, the claſsification of words in it, 84.
Landed proprietors depreſsed, causes of, 53—and consequences of, 54.
Laws, injudicious, prejudicial to agriculture, 44.
Leases, short, causes of their prevalency, 54.
Legality and antiquity of tythes examined, 438.
Levelling high ridges, slight notices of, 75.
Leicestershire, deplorable state of its agriculture, 369.
Linlithgow, account of by Viator, 102.
Linlithgow-loch, the eels of it leave it at one season, 425.
Lime, as a dreſsing for clayey soils, directions for applying it, 258.
Literature, benefits it would derive from the use of the symbolic character, 179.
Loch-fine herring fishery, 517.
Lochneſs salmon, a peculiarity respecting them noticed and accounted for, 419.
London, hints for the improvement of, 72.
London, migrations to it from the country, causes of, 452.
Longevity of some kinds of fishes, 323.
Lothians, state of agriculture in, 110.
Lower ranks of the people in Scotland, an interesting account of their present state.

M.

Macdonell, Mr. his interesting account of the different breeds of herrings, 508—and their various movements, 509.
Males, the education of, defects of, 406.
Man, the Isle of, its regality purchased, 442.
Mar, the earl of, his ancient castle, 212.
Marsh mole, see Platypus.
Martin Scribbler, junior, his humorous critique on a fragment of verses, 371.
Meanwell, Martha, on high raised roads, 416.
Mercantile notions, their prevalence tend to depreſs agriculture, 45.
Migrations of fishes, observations on, 415—the salmon, 415—ditto the eel, 421—ditto the herring, 428.

Money, the general decrease in its value, how it affects men of landed property, 54.
Money, on the different value of pieces of the same denomination, 288.
Monopolising of farms, causes of, 58—and consequences of, 59.
Mother of a family characterised, 410.
Movements of herrings, general notions concerning that, 510.
Murray, regent, account of his asasinination, 103.

N.

National vanity, remarks on, 181.
Netherlands, a visit to projected by the Editor, announced, 559.
Northmore, Mr. his plan for a symbolic character, 319.
Nouns, nature of that class of words, 84.
Number and person of verbs, how marked in the symbolic character, 100.

O.

Observations on the value of money at different times, 288.
Old man, an interesting account of, 465.
Olivier's travels in the Ottoman empire, account of, 23.
Ornithorynchus paradoxus, account of, 562.

P.

Parental education, eulogium of it, 410.
Parish schools in Scotland, the nature and consequences of that institution, 466.
Parson, John, White, his queries respecting cattle, 199.
Particularity in practical directions, the necessity of, 260.
Patriarchal governments characterised, 183.
Peace, reflections on by S. H. 225.
Perkins's tractors, observations on, 229.
Permanent grass fields, account of, 551.
Persia, account of by Olivier, 24.
Peterhead, elegant sea baths and fish ponds there, 524.
Philo Biblos, his notice of different plans of symbolic writing, 319.
Philologos, his observations on the symbolic character, 310.
Pith of trees, inquiry into its uses, 144—of use to strengthen the young shoots only, 145—becomes totally obliterated in them when old, 146—experiments prove that it is of no use to the growth of wood, 147.
Platypus anatinus, description of, with a figure, 562.
Play of the herrings described, 523.
Ploughing clayey soils, the Essex mode of doing it described, 385—objections to it, 386—a more perfect mode suggested, 387—deep ploughing not necessary, 388.
Political governments characterised, 183.
Poor's funds, the nature of these described, 475.
Poor's rates, the bad effects of them on farmers, 38—the bad effects of, particularly illustrated, 40.
Pope, money drawn from England by, anno 1244, 301—ditto from Scotland, anno 1269, 303.
Population, proofs that this island could sustain a hundred times its present amount, 554.
Potatoes, 233—see sprits.
Potatoes, experiments on, see sprits, experiments on, 278.
Practical directions for cultivating clayey soils—see clayey.
Prejudices, national, observations on, 181.
Premiums on importation of grain, their influence on agriculture, 50.
Profits on agriculture less than in other businesses, proofs of, 449.
Progress of herrings southward from the north seas erroneous, 430.
a Project for a new work on political economy mentioned, 559.
Pronouns, personal, observations on, 161—their variations, 162—imperfections as at present used, 163—might be easily remedied by the symbolic character, 164—table of, with their derivatives marked by symbols, 166.
Proposal for doing a dictionary for the symbolic character by subscription, 313.
Pseuda acacia, its uses in fencing, 557.

Q.

Queries respecting the management of a farm by Agricola, 241—answers to by the Editor, 244.

R.

Readers of this work, concluding address to, 565.
Reading, observations on, 412.
Reading memorandums, 239—400.
Reflections on the natural-history of fishes, 321.
Rents payable in money only, consequences of, 52.
Rent and tythe operate differently on the farmer, 486.
Ridges, how they should be laid out on a clayey soil, 388.

Roads, strictures on the formation of, 116.
Robbery, a curious argument in favour of, 483—legal, the tythe of this nature, 483.
Robinia pseuda acacia, its uses in fencing, 557.
Roller, its utility in reducing clods, 382.
Rushes, peculiarity of their stricture, 145.

S.

Salmon, an account of, 415—can live equally in fresh and in salt water, 415—moves to the shallow rills to deposit its spawn, 416—the young brood descend to the sea in May, 416—their rapid increase in size, 417—the necessity that this fish feels to change often from fresh to salt water, causes of, 418—Loch-ness salmon, a peculiarity affecting them, 419.
S. H. on peace, 225.
a Saunterer's observations on Snow-hill, &c. 71.
Scarcity, the present, observations on the causes of, 35—agricultural exertions repressed, 37—by tythe, 37—and poor's rate, 38—undue predilection in favour of trade and manufactures, 43—colonies and war, 47—corn laws, 48—premiums on importation of corn, 50—short leases, 54—abandonment of tillage, 56—monopolising of farms, its necessary consequence, 58.
Schin-loch, a remark respecting its eels, 427.
Scotland and England, the agriculture of compared, 416.
Scotchmen in London, numbers of, 451.
Scottish and English monies, tables of, 291.
Scribbler, M. jun. humorous critique by, 371.
Self importance the cause of many defects in conversation, 203.
Shallow clayey soils, their defects, 251.
Sheffield, lord, a letter to on the causes of the present scarcity, 35.
Short leases prejudicial, 54.
Soil, clayey, see clayey.
Smith's memoirs of wool specified, 45.
Sprits of potatoes, on raising them from 233—produce as large a crop as common plants of, 234—small eyes ditto, 236—observations on the above by the Editor, 237—an experiment respecting them, 278—observations on by the Editor, 279—experiments on, 280.
Symbolic mode of writing characterised, 13—the advantages above the alphabetic illustrated, 14—benefits that might be derived from adopting it, 16—Chinese writings of this sort, 17—alike legible by different nations who use different languages, 18—absurdities that have been propagated respecting it refuted, 19—facility with which a symbolic character may be devised, 82—devices for abridging the number of symbols, 84—a simple mode of devising a symbolic character described, 88—it could admit of being printed with ease, 93—and of being arranged in a dictionary that would be easy of reference, 94—form of the symbol for different parts of speech described, 96—gender of nouns, number, and person, how distinguished, 160—pronouns, personal, 163—great precision they would acquire by the symbolic mode of writing, 166—dictionary of language for the symbolic character, difficulties that occur respecting it, 169—perfections it must possess, 170—the plan here proposed different from that of bishop Wilkins, 173—that of the marquis of Worcester, 174—great advantages that would result to literature from the introduction of this character, 175—it should not supersede alphabetic writing.
Symbolic character, observations on by Philologos, 318—additional observations on, 313—a proposal for a dictionary of it by subscription, 313—script character, of the symbolic sort, hints on, 314—Mr. Northmore's plan for symbolic writing, 319—ditto by Cave Beck, 319.

T.

Table of the personal pronouns in symbolic characters, 166—of the increase and decrease of corn in Britain, 364.
Table of the value of English and Scottish monies at different periods, 291.
Table of the grains of pure silver in sterling money of different denominations, 297.
Thornton, B. Esq. humorous essay by, 371.
Temporary grass fields, how to be managed, 550.
Temptation, the necessity of guarding against it, 489.
Testament of the emperor of China, 190.
Tillage, the general abandonment, causes of, 56—and consequencee of, 57.
Tractors by Perkins, droll observations on, 76.
Trade and commerce, the causes of their having been peculiarly cherished, 45—consequences of, 46.
Travels of the French in Syria, 23—Persia, 24—Greece, 33.

INDEX.

Travels in Scotland by Viator, Linlithgow, 102—aſsaſsination of regent Murray, account of, 103—Falkirk, notices of Wallace and Bruce, 106—carse of Stirling, 108—Carron iron works, 108—agricultural state of this district, 109—coal mines at Bo-neſs, 110—electioneering anecdote, 112—Alloa, 212—Glen-devon, 214—Dollar, 216—Castle Campbell, 217—a feu, what, 219—geological observations, 221—breakfast in Scotland, 262—falls of Devon, 266—Devil's-bridge, 267—agricultural state of this district, 270—state of the lower ranks of people, 272—widow's fund explained, 462—parish schools, nature of, 466—a tremendous fight of cattle, 468—poor's funds in Scotland, 475.

Tythe and rent operate differently, 486—it operates powerfully in diminishing the clerical influence, 488.

Tythe, its effects in depreſsing agriculturs, 37.

V.

Vegetables derive their sustenance from water, 324.

Verbs, nature of that claſs of words, 85.

Verses, a fragment of humorous critique on, 371.

Viator, see travels.

W.

Wallace, sir William, his conversation with Bruce, 106.

War, its influence on agriculture, 47.

Water furnishes food for plants, 324—and for fishes, 326—and particularly herrings, 334.

Wheat, price of in England, anno 1316, 298—ditto 1346, 299—ditto 1269, 299—ditto 1548, 306—ditto 1455, 307.

Wheat, easy mode of drilling it, so as to be the same as a broad cast crop, 392.

Widows fund in Scotland, the particulars of this beneficent institution described,

Wilkins, bishop, his universal language, 173.

Will, the, of the emperor of China, 190.

Wiltshire, the migration of eels in that county, 424.

Woollen goods, value of the exports of from England, anno 1354, 305.

Worcester, marquis, his universal character, 174.

Writing, different modes that have been hitherto devised, 1.—susceptible of great improvements, 6.—illustration of by means of arabic numerals, 11.—hieroglyphic, alphabetic, and symbolic modes of writing distinguished, 12.—see symbolic.

Y.

Yarmouth herring fishery, 517.

Roads, strictures on the formation of, 116.
Robbery, a curious argument in favour of, 483—legal, the tythe of this nature, 483.
Robinia pseuda acacia, its uses in fencing, 557.
Roller, its utility in reducing clods, 382.
Rushes, peculiarity of their stricture, 145.

S.

Salmon, an account of, 415—can live equally in fresh and in salt water, 415—moves to the shallow rills to deposit its spawn, 416—the young brood descend to the sea in May, 416—their rapid increase in size, 417—the necessity that this fish feels to change often from fresh to salt water, causes of, 418—Loch-ness salmon, a peculiarity affecting them, 419.
S. H. on peace, 225.
a Saunterer's observations on Snow-hill, &c. 71.
Scarcity, the present, observations on the causes of, 35—agricultural exertions repressed, 37—by tythe, 37—and poor's rate, 38—undue predilection in favour of trade and manufactures, 43—colonies and war, 47—corn laws, 48—premiums on importation of corn, 50—short leases, 54—abandonment of tillage, 56—monopolising of farms, its necessary consequence, 58.
Schin-loch, a remark respecting its eels, 427.
Scotland and England, the agriculture of compared, 416.
Scotchmen in London, numbers of, 451.
Scottish and English monies, tables of, 291.
Scribbler, M. jun. humorous critique by, 371.
Self importance the cause of many defects in conversation, 203.
Shallow clayey soils, their defects, 251.
Sheffield, lord, a letter to on the causes of the present scarcity, 35.
Short leases prejudicial, 54.
Soil, clayey, see clayey.
Smith's memoirs of wool specified, 45.
Sprits of potatoes, on raising them from 233—produce as large a crop as common plants of, 234—small eyes ditto, 236—observations on the above by the Editor, 237—an experiment respecting them, 278—observations on by the Editor, 279—experiments on, 280.
Symbolic mode of writing characterised, 13—the advantages above the alphabetic illustrated, 14—benefits that might be derived from adopting it, 16—Chinese writings of this sort, 17—alike legible by different nations who use different languages, 18—absurdities that have been propagated respecting it refuted, 19—facility with which a symbolic character may be devised, 82—devices for abridging the number of symbols, 84—a simple mode of devising a symbolic character described, 88—it could admit of being printed with ease, 93—and of being arranged in a dictionary that would be easy of reference, 94—form of the symbol for different parts of speech described, 96—gender of nouns, number, and person, how distinguished, 160—pronouns, personal, 163—great precision they would acquire by the symbolic mode of writing, 166—dictionary of language for the symbolic character, difficulties that occur respecting it, 169—perfections it must possess, 170—the plan here proposed different from that of bishop Wilkins, 173—that of the marquis of Worcester, 174—great advantages that would result to literature from the introduction of this character, 175—it should not supersede alphabetic writing.
Symbolic character, observations on by Philologos, 318—additional observations on, 313—a proposal for a dictionary of it by subscription, 313—script character, of the symbolic sort, hints on, 314—Mr. Northmore's plan for symbolic writing, 319—ditto by Cave Beck, 319.

T.

Table of the personal pronouns in symbolic characters, 166—of the increase and decrease of corn in Britain, 364.
Table of the value of English and Scottish monies at different periods, 291.
Table of the grains of pure silver in sterling money of different denominations, 297.
Thornton, B. Esq. humorous essay by, 371.
Temporary grass fields, how to be managed, 550.
Temptation, the necessity of guarding against it, 489.
Testament of the emperor of China, 190.
Tillage, the general abandonment, causes of, 56—and consequencee of, 57.
Tractors by Perkins, droll observations on, 76.
Trade and commerce, the causes of their having been peculiarly cherished, 45—consequences of, 46.
Travels of the French in Syria, 23—Persia, 24—Greece, 33.

INDEX.

Travels in Scotland by Viator, Linlithgow, 102—assassination of regent Murray, account of, 103—Falkirk, notices of Wallace and Bruce, 106—carse of Stirling, 108—Carron iron works, 108—agricultural state of this district, 109—coal mines at Bo-ness, 110—electioneering anecdote, 112—Alloa, 212—Glen-devon, 214—Dollar, 216—Castle Campbell, 217—a feu, what, 219—geological observations, 221—breakfast in Scotland, 262—falls of Devon, 266—Devil's-bridge, 267—agricultural state of this district, 270—state of the lower ranks of people, 272—widow's fund explained, 462—parish schools, nature of, 466—a tremendous fight of cattle, 468—poor's funds in Scotland, 475.

Tythe and rent operate differently, 486—it operates powerfully in diminishing the clerical influence, 488.

Tythe, its effects in depressing agriculturs, 37.

V.

Vegetables derive their sustenance from water, 324.

Verbs, nature of that class of words, 85.

Verses, a fragment of humorous critique on, 371.

Viator, see travels.

W.

Wallace, sir William, his conversation with Bruce, 106.

War, its influence on agriculture, 47.

Water furnishes food for plants, 324—and for fishes, 326—and particularly herrings, 334.

Wheat, price of in England, anno 1316, 298—ditto 1346, 299—ditto 1269, 299—ditto 1548, 306—ditto 1455, 307.

Wheat, easy mode of drilling it, so as to be the same as a broad cast crop, 392.

Widows fund in Scotland, the particulars of this beneficent institution described,

Wilkins, bishop, his universal language, 173.

Will, the, of the emperor of China, 190.

Wiltshire, the migration of eels in that county, 424.

Woollen goods, value of the exports of from England, anno 1354, 305.

Worcester, marquis, his universal character, 174.

Writing, different modes that have been hitherto devised, 1.—susceptible of great improvements, 6.—illustration of by means of arabic numerals, 11.—hieroglyphic, alphabetic, and symbolic modes of writing distinguished, 12.—see symbolic.

Y.

Yarmouth herring fishery, 517.

ERRATA.

Please mark the following with the pen before you begin to read.

Page 9, secondary indexes 2, dele the upper stroke on the right hand side.
.... 134, line 10, *for* " one hour," *read* " a few hours."
.... 136, line 8, *for* " hours," *read* " days."
.... 137, line 21, *for* " thick," *read* " broad."
.... 166, on the left hand side of the table insert the word
NOMINATIVE, *opposite the first line of characters.*
ACCUSATIVE, *in a line with the second row.*
DEFINITIVE, *in a line with the third row, and*
POSSESSIVE, *in a line with the fourth row of characters.*
.... 167, line 6 and 7, the characters are interchanged.
.... 182, line 4, *for* " variations," *read* " deviations."
.... 182, line 19, after sustenance, add, to a numerous people.
.... 185, line 20, *for* " unaſsuming," *read* " unabating."
.... 186, line 9, *for* " ascertained," *read* " entertained."
.... 245, line 10 from bottom, *for* " fog," *read* " moſs."
.... 278, No. 11, col. 1st. *for* " 6," *read* " 0."

	Grains.	£.	s.	d.	f.
.... 292, table, line 1, column Scotland, insert	5328. 00....	3	2	6	0

.... 293, line 4 from bottom, *for* " 3360," *read* " 3330."
.... 305, under the example 1354, line 6, *for* " thirty-six hundred," *read* " six hundred."
.... 315, line 6 from bottom, *for* " infinition," *read* " infinitum."
.... 317, last line, *for* " noun," *read* " verb."
.... 318, line 7, character, the mark should be below, not above the middle joining.
.... 339, line 13, *for* " be," *read* " lie."
.... 352, *for* " ingenuous," *read* " ingenious."
.... 367, line 3 from bottom, *for* " six," *read* " five."
.... 380, *for* " eome," *read* " come."
.... 415, line 2, *for* " or," *read* " and."
.... 415, line 16, dele but.
.... 428, line 4 from bottom, *for* " emigrations," *read* " migrations."
.... 441, line 11, *for* " thus," *read* " then."
.... 451, line 15, *for* " leſs," *read* " truly leſs."
.... 477, line 11, *for* " consonants," *read* " conjunctions."

T. BENSLEY, Printer, Bolt Court, Fleet Street, London.